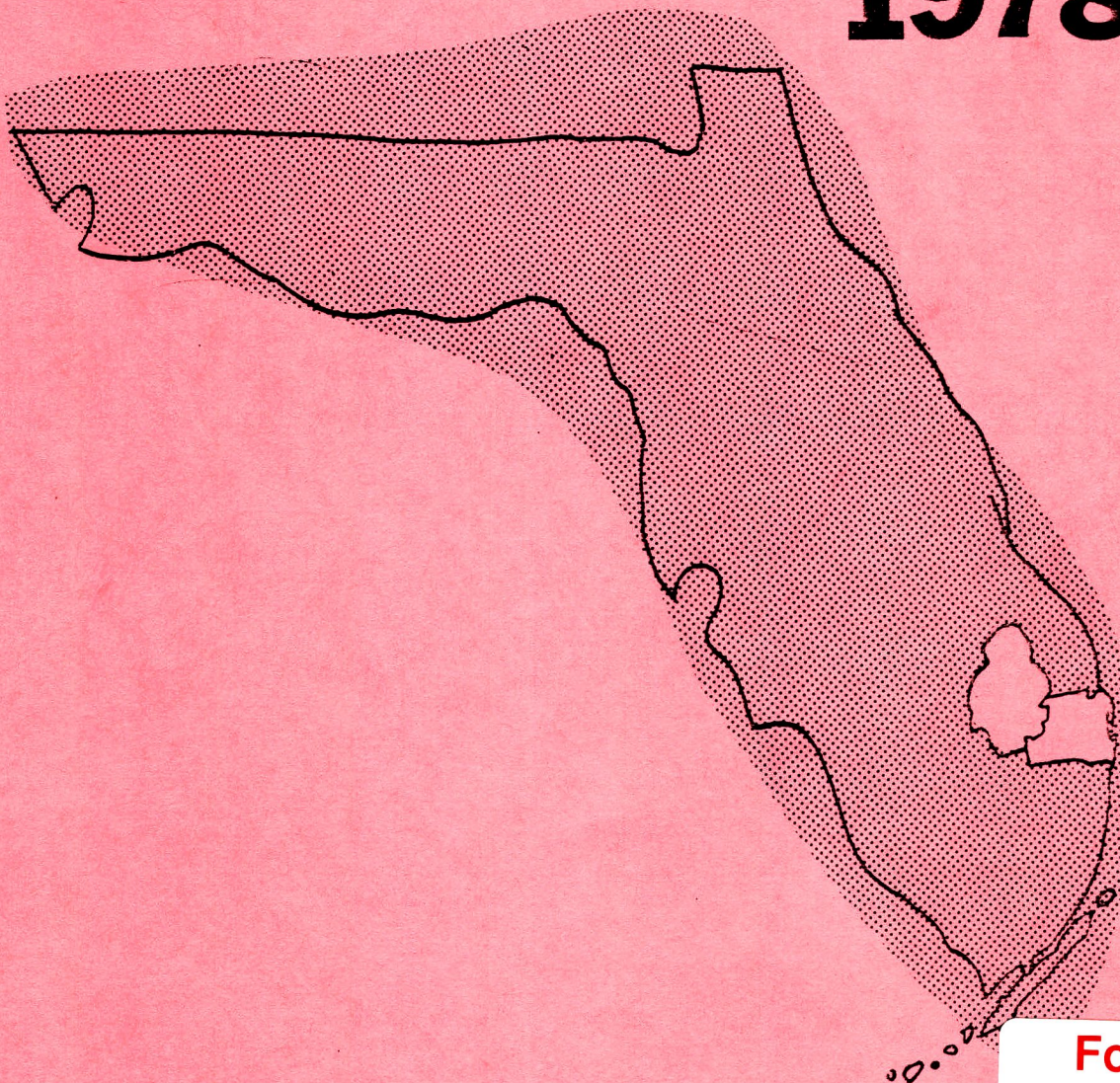


**PALM BEACH COUNTY, FLORIDA  
DIVISION OF ENVIRONMENTAL  
SCIENCE AND ENGINEERING  
AIR POLLUTION CONTROL**

# **ANNUAL REPORT 1978**



**For Reference**

Not to be taken from this room

**PALM BEACH COUNTY HEALTH DEPARTMENT**



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## I INTRODUCTION

Palm Beach County is located along the southeast coast of Florida, and is part of what is generally called the "Florida Gold Coast". The "Gold Coast" consists of four counties: Palm Beach, Broward, Dade, and Monroe. Palm Beach County is geographically separated into two regions: one region is a highly urbanized coastal strip, stretching approximately forty-five (45) miles from Tequesta on the north, to Boca Raton on the south; and the other is agricultural, located in the western portion of Palm Beach County (the Glades Area).

The population distribution within the County depicts this same unusual pattern. Virtually all of the population is located in two relatively small areas: the coastal strip adjacent to the Atlantic Ocean and along a narrow band adjacent to Lake Okeechobee. A population table is included in this section.

The majority of the population, approximately 90%, is located on the coast for a distance of approximately ten miles inland from the Atlantic Ocean. Developments through the years have resulted in several municipalities along the coastal strip.

The band adjacent to Lake Okeechobee contains virtually all of the remaining 10% of the County's population. Municipalities which are included in the Glades area are: Belle Glade, Pahokee, and South Bay. The economy of this area is an agricultural one, based principally on sugarcane and winter vegetables.

Tourism and related fields continue to be the major economic factors of this area. Tourism has increased along with increased population.



Other major industries in the area include building construction and related fields, agriculture, aircraft testing facility, cement and concrete, asphaltic concrete, and the service industries.

The complexity of the problems of Air Pollution Control are related to the widespread growth of Palm Beach County. Advances in environmental protection activities, which are being carried out by this program, have been utilized in order to keep abreast of air pollution problems. These activities are characteristic of urban areas across the nation.

The administration of the state air permit system is one of the many activities handled by the Air Pollution Section of the Palm Beach County Health Department. The Department of Environmental Regulation requires both a permit to construct and a permit to operate any air pollution source. As administrator of the permit system, our local program is in the position to prevent the improper construction of a pollution source and to assure that adequate pollution control equipment is utilized and maintained.

Other activities include: consultations with industries and engineers on impending permit action; enforcement action; complex source requirements; and required compliance schedule and increments of progress surveillance. Also, our local program investigates and initiates the necessary follow-up action regarding all citizen complaints. As part of the State Air Implementation Plan, this agency is required to conduct source surveillance and source inspection of existing and new sources in Palm Beach County, in order to assure that all sources are in compliance with State air pollution regulations.



The air monitoring capabilities of our program continues to be the ultimate means of maintaining Air Quality Standards for Palm Beach County. The Environmental Control Air Monitoring Laboratory, which is located in West Palm Beach, has the capabilities of continuously measuring: Total Hydrocarbons (THC), Carbon Monoxide (CO), Sulfur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), and four meteorological parameters (Wind Speed, Wind Direction, Temperature, and Relative Humidity). All the aforementioned data are collected through the use of recorders plus a centrally controlled data acquisition system. The data is then transcribed on SAROAD (Storage and Retrieval of Aerometric Data) forms for input into the National Aerometric Data Bank.

A second completely continuous monitoring meteorological system (Wind Speed, Wind Direction, Temperature, and Relative Humidity) along with a continuous SO<sub>2</sub> monitor was employed in our mobile air monitoring trailer, used in sampling of selected areas during periods of special interest. Additionally, the air pollution control program has continued its monitoring for the frequency and intensity of temperature inversions at the Division of Forestry's observation tower located at Loxahatchee, Florida.

During 1978 the air quality monitoring network included eleven (11) high volume particulate sites; one continuous monitoring site; one mobile air monitoring trailer, and three (3) nitrogen dioxide bubbler sites. Our chemistry laboratory located in Delray Beach handles all analyses pertaining to air pollution.

Public relation activities during the past year by the Air Pollution section of the Palm Beach County Health Department have consisted of continued steps to inform the general public of the

programs and procedures established to maintain our good air quality. These activities include wide distribution of our Annual Report, extending invitations to groups of school children and environmental clubs to visit our facilities, and presentations to schools and civic groups throughout the County on the topic of "Air Pollution Control in Palm Beach County". In addition, a major aspect of our program's public relations activities is the dissemination, twice daily, of a "Pollution Standard Index" to the local news media. The index utilizes the daily results of all measured pollutants.



TABLE I  
POPULATION OF  
PALM BEACH COUNTY, FLORIDA

| <u>MUNICIPALITY</u>  | <u>1976</u> | <u>1977</u> | <u>1978</u> |
|----------------------|-------------|-------------|-------------|
| Atlantis             | 1,292       | 1,444       | 1,572       |
| Belle Glade          | 15,398      | 15,665      | 15,554      |
| Boca Raton           | 43,721      | 44,668      | 46,434      |
| Boynton Beach        | 32,004      | 32,160      | 32,817      |
| Briny Breezes        | 798         | 798         | 798         |
| Cloud Lake           | 154         | 154         | 154         |
| Delray Beach         | 31,583      | 32,238      | 34,210      |
| Glen Ridge           | 213         | 213         | 213         |
| Golf (Village)       | 133         | 137         | 142         |
| Golfview             | 210         | 210         | 210         |
| Greenacres           | 5,691       | 6,032       | 6,310       |
| Gulfstream           | 519         | 533         | 540         |
| Haverhill            | 1,104       | 1,113       | 1,114       |
| Highland Beach       | 1,879       | 2,172       | 2,224       |
| Hypoluxo             | 400         | 403         | 407         |
| Juno Beach           | 1,144       | 1,148       | 1,148       |
| Jupiter              | 6,862       | 7,402       | 7,996       |
| Jupiter Inlet Colony | 452         | 452         | 456         |
| Lake Clarke Shores   | 3,134       | 3,177       | 3,207       |
| Lake Park            | 8,268       | 8,388       | 8,364       |
| Lake Worth           | 28,252      | 28,431      | 28,721      |
| Lantana              | 8,536       | 8,581       | 8,565       |
| Manalapan            | 300         | 301         | 308         |
| Mangonia Park        | 1,335       | 1,341       | 1,363       |
| North Palm Beach     | 12,342      | 12,406      | 12,440      |
| Ocean Ridge          | 1,256       | 1,279       | 1,296       |
| Pahokee              | 5,539       | 5,521       | 5,417       |
| Palm Beach           | 8,787       | 8,780       | 8,966       |
| Palm Beach Gardens   | 9,878       | 10,581      | 11,994      |
| Palm Beach Shores    | 1,063       | 1,063       | 1,060       |
| Palm Springs         | 7,628       | 7,644       | 8,315       |
| Riviera Beach        | 27,485      | 28,467      | 29,669      |
| Royal Palm Beach     | 3,731       | 4,093       | 4,359       |
| South Bay            | 3,195       | 3,193       | 3,181       |
| South Palm Beach     | 1,684       | 1,684       | 1,684       |
| Tequesta             | 3,848       | 3,900       | 3,986       |
| West Palm Beach      | 64,634      | 64,933      | 65,105      |
| Total Incorporated   | 344,452     | 350,705     | 360,299     |
| Unincorporated       | 161,744     | 166,170     | 173,672     |
| TOTAL COUNTY         | 506,196     | 516,875     | 533,971     |

NOTE: Population estimates were revised by the Area Planning Board in December 1978.

## II METEOROLOGY

### GENERAL

Topography is of primary importance whenever the meteorological aspects of a given region are to be evaluated. Palm Beach County is a fairly level region. For the most part, Palm Beach County is between 10 and 20 feet above sea level. All urban development is located along the eastern 10 miles of the coastal strip. Most of the western portions of the County are covered by agricultural lands or everglades. The agricultural lands are endowed with a rich peat-like "muck" soil. The Atlantic Ocean borders the eastern edge of the County and the Gulf Stream flows northward approximately 3 miles off-shore. Seldom does a cold air mass reach this region without being modified due to marine influences and our southern location. Light freezes occur infrequently along the coastal areas of the County and more frequently in the everglades and agricultural areas. The most eastern parts of the County come under the influence of the sea breeze during the day and land breeze during the night. Based on weather data accumulated at Palm Beach International Airport (Table 2), August is the warmest month with a mean of 82.3°F, a maximum mean of 90.2°F, and minimum mean of 74.4°F. From the same data, January is the coldest month with a mean of 65.5°F, a maximum mean of 75.0°F and a minimum mean of 55.9°F. Rain showers and/or thunderstorms of short duration are frequent during the summer season. Palm Beach County receives the greatest amount of rainfall during the summer and fall. As indicated in Table 2, the County receives an average 62.06 inches of rain per year.



TABLE 2  
PALM BEACH COUNTY AIRPORT  
METEOROLOGICAL MEANS

| MONTH     | MEAN<br>MAXIMUM<br>TEMPERATURE | MEAN<br>MINIMUM<br>TEMPERATURE | MEAN<br>MONTHLY<br>TEMPERATURE | MEAN<br>MONTHLY<br>PRECIP. (IN) | PREVAILING<br>WIND<br>DIRECTION | MEAN<br>WIND<br>SPEED (mi/hr) |
|-----------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|-------------------------------|
| JANUARY   | 75.0                           | 55.9                           | 65.5                           | 2.60                            | NW                              | 9.8                           |
| FEBRUARY  | 76.0                           | 56.2                           | 66.1                           | 2.60                            | SE                              | 10.3                          |
| MARCH     | 79.3                           | 60.2                           | 69.8                           | 3.32                            | SE                              | 10.7                          |
| APRIL     | 82.9                           | 64.9                           | 73.9                           | 3.51                            | E                               | 10.9                          |
| MAY       | 86.1                           | 68.9                           | 77.5                           | 5.17                            | ESE                             | 9.6                           |
| JUNE      | 88.3                           | 72.7                           | 80.5                           | 8.14                            | ESE                             | 8.0                           |
| JULY      | 89.6                           | 74.1                           | 81.9                           | 6.52                            | ESE                             | 7.5                           |
| AUGUST    | 90.2                           | 74.4                           | 82.3                           | 6.91                            | ESE                             | 7.4                           |
| SEPTEMBER | 88.3                           | 74.7                           | 81.5                           | 9.85                            | ENE                             | 8.7                           |
| OCTOBER   | 84.3                           | 70.1                           | 77.2                           | 8.75                            | ENE                             | 10.0                          |
| NOVEMBER  | 79.5                           | 62.5                           | 71.0                           | 2.48                            | ENE                             | 9.9                           |
| DECEMBER  | 76.1                           | 57.4                           | 66.8                           | 2.21                            | NNW                             | 9.9                           |
| YEARLY    | 83.0                           | 66.0                           | 74.5                           | 62.06                           | ESE                             | 9.4                           |

Palm Beach County can be classified as a semitropical region. The Quasi-permanent location of the "Bermuda" high pressure area governs our weather. It causes our prevailing easterly surface winds in addition to supplying the warm moist air necessary to produce the frequent air mass, frontal or nocturnal rainshowers and/or thunderstorms that occur in the County. The position of the "Bermuda" high pressure area is also conducive to the formation of an atmosphere capable of causing high pollution days. This atmosphere can easily occur if cold air from the north moves underneath the warm moist air brought into the County by the "Bermuda" high. The result is a temperature inversion or increase of temperature with height which traps the pollutants in the lower levels.

Meteorological parameters play a significant role in understanding the over-all air pollution cycle. The motions of the atmosphere are extremely variable and must be thoroughly examined in order to determine the movement and dispersement of pollutants. Both wind direction and wind speed are of primary importance. The surface wind and the wind found in the first few hundred feet of our atmosphere must be studied to determine diffusion and movement of the pollutants. The wind direction is indicative of the direction of travel of the pollutants. The wind speed determines the time it takes the pollutants to travel to a receptor and is a function of the amount of dilution of the pollutant. Light winds, coupled with other factors, contribute to poor air quality episodes. U.S. Weather Service records for Palm Beach International Airport show the prevailing wind directions for the months of February through November are from one of the easterly headings.



Mean monthly speeds vary between 7.4 mi/hr in August and 10.9 mi/hr in April (Table 2). The wind direction and speed for the 1978 (Table 3) taken at our continuous monitoring site in West Palm Beach shows that a higher percentage of winds were from the east-north-east, east, or east-southeast directions and the majority of the wind speeds were in the 4-10 mi/hr category. Table 4, wind direction and speed (Belle Glade) is included in this section for information purposes.

TABLE 3  
 SITE #1 - WEST PALM BEACH  
 WIND DIRECTION AND SPEED (MI/HR) OCCURRENCES  
 1978

| DIRECTION      | 1-3   | 4-6   | 7-10  | 11-16 | 17-21 | 22-27 | TOTAL | PERCENT |
|----------------|-------|-------|-------|-------|-------|-------|-------|---------|
| 35-36-01 (N)   | 173   | 159   | 179   | 107   |       |       | 618   | 7.46    |
| 02-03-04 (NNE) | 305   | 289   | 130   | 27    |       |       | 751   | 9.07    |
| 05-06-07 (ENE) | 572   | 435   | 93    | 8     |       |       | 1108  | 13.38   |
| 08-09-10 (E)   | 305   | 530   | 264   | 16    |       |       | 1115  | 13.47   |
| 11-12-13 (ESE) | 176   | 293   | 283   | 26    | 3     |       | 781   | 9.43    |
| 14-15-16 (SSE) | 90    | 166   | 255   | 173   | 7     |       | 691   | 8.35    |
| 17-18-19 (S)   | 124   | 102   | 82    | 50    | 8     |       | 366   | 4.42    |
| 20-21-22 (SSW) | 164   | 100   | 51    | 27    | 1     |       | 343   | 4.14    |
| 23-24-25 (WSW) | 117   | 51    | 57    | 10    | 2     |       | 237   | 2.86    |
| 26-27-28 (W)   | 129   | 83    | 63    | 10    | 1     |       | 286   | 3.45    |
| 29-30-31 (WNW) | 206   | 151   | 92    | 23    | 5     |       | 477   | 5.76    |
| 32-33-34 (NNW) | 323   | 265   | 191   | 53    |       |       | 832   | 10.05   |
| CALM           | 674   |       |       |       |       |       | 674   | 8.14    |
| TOTAL          | 3358  | 2624  | 1740  | 530   | 27    |       | 8279  |         |
| PERCENT        | 40.56 | 31.70 | 21.02 | 6.40  | .33   |       |       |         |



TABLE 4

SITE #8 - BELLE GLADE  
WIND DIRECTION AND SPEED (MI/HR) OCCURRENCES  
1978

| DIRECTION      | 1-3   | 4-6   | 7-10  | 11-16 | 17-21 | 22-27 | TOTAL | PERCENT |
|----------------|-------|-------|-------|-------|-------|-------|-------|---------|
| 35-36-01 (N)   | 66    | 85    | 88    | 30    | 1     |       | 270   | 6.85    |
| 02-03-04 (NNE) | 353   | 151   | 55    | 11    |       |       | 570   | 14.46   |
| 05-06-07 (ENE) | 249   | 122   | 35    | 6     |       |       | 412   | 10.45   |
| 08-09-10 (E)   | 199   | 67    | 34    | 2     |       |       | 302   | 7.66    |
| 11-12-13 (ESE) | 189   | 78    | 48    |       |       |       | 315   | 7.99    |
| 14-15-16 (SSE) | 139   | 81    | 64    |       |       |       | 284   | 7.20    |
| 17-18-19 (S)   | 145   | 73    | 38    | 14    |       |       | 270   | 6.85    |
| 20-21-22 (SSW) | 117   | 67    | 50    | 28    | 1     |       | 263   | 6.67    |
| 23-24-25 (WSW) | 95    | 32    | 27    | 4     | 1     |       | 159   | 4.03    |
| 26-27-28 (W)   | 93    | 33    | 21    | 3     |       |       | 150   | 3.80    |
| 29-30-31 (WNW) | 56    | 62    | 38    | 5     |       |       | 161   | 4.08    |
| 32-33-34 (NNW) | 136   | 167   | 184   | 22    |       |       | 509   | 12.91   |
| CALM           | 277   |       |       |       |       |       | 277   | 7.03    |
| TOTAL          | 2114  | 1018  | 682   | 125   | 3     |       | 3942  |         |
| PERCENT        | 53.63 | 25.82 | 17.30 | 3.17  | .08   |       |       |         |

III  
INSPECTIONS, COMPLAINT INVESTIGATIONS,  
SURVEILLANCE AND ENFORCEMENT

The Air Pollution Control (APC) staff of the Palm Beach County Health Department continues to operate in accordance with the Palm Beach County Environmental Control Ordinance, which adopted by reference, those state of Florida statutes and codes that pertain to environmental matters.

Inspections, complaint investigations, surveillance and enforcement activities of the APC staff during the reporting period of January 1, 1978 through December 31, 1978 are shown below.

Inspections

|  |     |
|--|-----|
| Permitted Air Pollution Source Inspections | 386 |
| Open Burning Request Inspections           | 85  |
| Total                                      | 471 |

This is an increase of thirty four (34) inspections over the last reporting period.

Complaint Investigations

|                      |     |
|----------------------|-----|
| Smoke (Open Burning) | 53  |
| Odors                | 38  |
| Dust & Fumes         | 31  |
| Noise                | 10  |
| Pollen Deposits      | 2   |
| Fungus Spots         | 2   |
| Total                | 136 |

This is an increase of thirty one (31) complaint investigations over the previous reporting period.



### Surveillance & Enforcement

Violations of Chapters 17-2, 17-4 and 17-5 Florida Administrative  
Code observed and formal Notice of Violation issued:

|                  |    |
|------------------|----|
| Chapter 17-2 FAC | 55 |
| Chapter 17-4 FAC | 22 |
| Chapter 17-5 FAC | 4  |
| Total            | 81 |

This is an increase of twenty (20) surveillance and enforcement  
actions over the last reporting period.

IV  
TECHNICAL STUDIES

INTRODUCTION

The ambient air monitoring program in Palm Beach County during the year 1978 consisted of the following:

Suspended Particulate (Daily/Monthly) - 11 Sites

Total Gravimetric

Benzene Soluble Organics

Sulfates

Nitrates

Continuous Gaseous Monitoring - 1 Site

Nitrogen Dioxide

Carbon Monoxide

Total Hydrocarbons

Sulfur Dioxide

Ozone

Continuous Gaseous Monitoring - 1 Site

Sulfur Dioxide

Continuous Meteorological Monitoring - 2 Sites

Wind Speed

Wind Direction

Temperature

Relative Humidity

Continuous Temperature Inversion Monitoring - 1 Site

Temperature, 2 Levels

Manual Gaseous Monitoring

Nitrogen Dioxide - 3 Sites

Microscopic Morphology

All data collected is reported monthly to the Department of Environmental Regulation and to the Environmental Protection Agency for inclusion in air quality data banks (SAROAD). Gaseous pollutant levels and meteorological conditions from one site are relayed by data line to the agency's office data acquisition system. Instantaneous levels of these parameters are available at all times. One, three, eight and twenty-four hour averages are calculated and recorded.

Locations of the monitoring sites are shown in Figure 1. Table 5 gives site identification numbers, addresses, and parameters measured for all monitoring sites within the County. Table 6 relates measured air quality within Palm Beach County for the year 1978 to the Federal and State Ambient Air Quality Standards.

#### PERMANENT MONITORING NETWORK

The original monitoring network for suspended particulate, sites one thru eight, were established in 1969. The Military Trail intercept line, sites nine thru twelve, was added in 1972. Six of these twelve stations have been maintained as suspended particulate monitoring sites thru the report period. The total suspended particulate monitoring stations in Pahokee and Belle Glade have been relocated to conform with current siting criteria during the report period.



Methodology: Standard High volume Samplers and shelters are located at each of the eleven sites. Samples are collected and handled in accordance with Reference Method for the Determination of Suspended Particulates in the Atmosphere (High Volume Method), Federal Register, Vol. 36, No. 84 - Friday, April 30, 1971. Sampling time is twenty-four hours, running from midnight to midnight for each sampling date. The standard six day schedule as recommended by EPA is followed. Quality assurance practice as required by EPA are fully implemented for this pollutant.

Nitrate and Sulfate determinations are made according to procedures described in Selected Methods for the Measurement of Air Pollutants, U. S. Department of Health, Education and Welfare, May, 1965; Public Health Service Publication No. 9998-AP-11. Benzene soluble organics are determined by procedures described in Analysis of Atmospheric Organics, a Training Course Manual published by the U. S. Department of Health, Education and Welfare.

Tabulated results for suspended particulate for the year 1978 are presented in tables 7, 8, and 9. Figure 2 presents the range of probable logarithmic values for suspended particulate at all eleven stations for the years 1977 and 1978. A historical summation for total suspended particulate measurements from 1969 to the present is presented in Tables 10 and 11.

#### GASEOUS MONITORING

Periodic automated monitoring of sulfur dioxide, nitrogen dioxide and total oxidants at sites 1 thru 8 was begun in June of

1970. Carbon Monoxide monitoring was added in January of 1971. Total hydrocarbon monitoring was begun in May of 1972. The automated gaseous and meteorological monitoring equipment was installed in the West Palm Beach monitoring station (Site 1) in November of 1972. Original Technicon Monitoring equipment for nitrogen dioxide, sulfur dioxide and total oxidants was replaced during the third quarter of 1973. The monitoring of total oxidants was discontinued and replaced by the monitoring of ozone. Plans are now underway to relocate the carbon monoxide, ozone and sulfur dioxide monitors in accord with the State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS) network design. A special study of sulfur dioxide levels and meteorological parameters was begun in Belle Glade (Site 8) in September of 1972. Two manual stations for the measurement of nitrogen dioxide were established in November of 1973. These sites were maintained as part of the State Air Quality Surveillance Program as required by the State Air Implementation Plan until October, 1978.

Maximum ambient air concentrations for gaseous sampling in Palm Beach County for the period 1970 - 1978 are presented in Table 12.

#### NITROGEN DIOXIDE

Continuous automatic monitoring for this pollutant is carried on at Site 1. A MEC Model 1200 NO-NO<sub>x</sub> (McMillan Electronics Corporation) chemiluminescence analyzer was in use from November 15, 1973 until December 27, 1977. At this time it was replaced

by Monitor Laboratory Model 8440. Table 13 presents monthly and annual sampling time, arithmetic means and twenty-four hour maximum concentrations. Values recorded during the periods of operation indicate levels of this pollutant well below those specified by the Ambient Air Standard. Table 14 includes quarterly and annual one, eight and twenty-four hour concentration maximums, annual arithmetic means and the frequency distribution of ranges of pollutant levels recorded.

Manual samplers for this pollutant were operated at Site 3 until April, 1978 and at Sites 13 and 14 until October 1978. Sampling procedure is as described in the Federal Register, Volume 38, No. 110, Friday June 8, 1973. Frequency of sampling was every sixth day. Table 15 presents number of samples, arithmetic averages and twenty-four hour maximums for each of the sites. Values recorded place the measured concentrations of this pollutant well below those of the Ambient Air Quality Standard. Tables 16, 17 and 18 give monthly and annual sampling frequency, maximum recorded values, and arithmetic means for each station.

#### CARBON MONOXIDE

This pollutant is monitored continuously at Site 1. A Mine Safety Appliances, Model 200 nondispersive infrared spectrophotometric automatic analyzer, in service since January 1971, was retired and replaced by a Model 202-S on October 6, 1977.



Table 19 presents a monthly record of sampling hours, one and eight hour maximums, and relates concentration maximums to the Ambient Air Quality Standard. There were no recorded values in excess of the one hour or eight hour standards during the report period.

Table 20 presents quarterly, one and eight hour maximum values and frequency distribution of all recorded pollutant levels.

#### OZONE

This pollutant has been monitored continuously since September 6, 1973 at Site 1. The instrumentation is a MEC Model 1100 (McMillan Electronic Corporation) chemiluminescence analyzer. During this report period the instrument was modified by the manufacturer to EPA designated reference method status. A Dasibi Model #1003 P.C. was placed in service December 15, 1978 for use in the calibration of the monitor.

Table 21 presents a monthly record of hours sampled and one hour maximums recorded. There were no values recorded which exceed the Ambient Air Quality Standard for this pollutant.

One, eight and twenty-four maximums and the frequency distribution for all pollutant levels recorded are presented on a quarterly basis in Table 22.

#### TOTAL HYDROCARBONS

This pollutant is monitored on a continuous basis at Site 1.

Instrumentation is a Mine Safety Appliances Flame Ionization Total Hydrocarbon analyzer. The study was begun May 18, 1972.

Table 23 reports hours sampled and maximum three hour values recorded, six to nine A.M., on a monthly basis. These hours are chosen as they were in the establishment of the Ambient Air Quality Standards, to reflect the influence of the morning peak traffic hours. The standard for hydrocarbon relates to hydrocarbon concentrations after subtracting methane concentrations. Because instrumentation to measure methane is not available to this agency, no such correction can be made to the values recorded and no attempt is made to relate values to ambient air quality standards.

Maximum one, eight, twenty-four and three hour (6-9 a.m.) concentration are reported in Table 24 on a quarterly basis. A frequency distribution for all values recorded is also presented.

#### SULFUR DIOXIDE

This pollutant is measured continuously at two sites within the County. Monitoring instruments are Beckman 906-A Sulfur Dioxide analyzers, based on coulometric titration.

Site 1, located in West Palm Beach, monitors sulfur dioxide levels in the coastal region of the County. Table 25 reports a monthly history of hours sampled, one, three, and twenty-four hour maximums, and the number of violations for each of the related standards. Table 26 presents a quarterly and annual record of maximum values and a frequency distribution of values recorded. Calculation of an arithmetic mean for this pollutant is not feasible because ninety-nine percent of the values are below the limit of sensitivity for the instrument.

A sampling program in the West County Area was initiated on July 8, 1975 and continued until May 19, 1978. The monitor was located in a converted trailer which allowed for simultaneous measurement of meteorological conditions. The trailer was located at the Palm Beach County Health Department, Canal Street, Belle Glade, Florida. Table 27 reports a monthly history of hours sampled, one, three, and twenty-four maximums, and the number of violations for each of the standards. Table 28 presents a quarterly and annual record of maximum values and a frequency distribution of values recorded.



TABLE 5  
MONITORING SITE LOCATIONS

| SITE NO. | ADDRESS  | UTM<br>ZONE 17        | MONITORING<br>CAPABILITY   |
|----------|--|-----------------------|--|
| 1        | West Palm Beach<br>Water Treatment Plant<br>First Street and Tamarind Ave.<br>West Palm Beach, Florida | 2955030N<br>0593232E  | Susp. Part.<br>THC, CO, SO <sub>2</sub><br>NO <sub>2</sub> , O <sub>3</sub><br>Meteorology |
| 2        | Tequesta Water Department<br>357 Tequesta Drive<br>Tequesta, Florida                                   | 2982018N<br>0589963E  | Discontinued<br>December 27, 1977  |
| 3        | North Palm Beach<br>Water Treatment Plant<br>603 Anchorage Drive<br>North Palm Beach, Florida          | 2965817N<br>0592780E  | Susp. Part.<br>NO <sub>2</sub><br>NO <sub>2</sub> Discontinued<br>April 1, 1978            |
| 4        | Lake Worth<br>Water Treatment Plant<br>301-303 College Street<br>Lake Worth, Florida                   | 2943537N<br>0592793E  | Susp. Part.  |
| 5        | Delray Beach<br>Water Treatment Plant<br>202 N.W. 1st Avenue<br>Delray Beach, Florida                  | 2927488N<br>0592195E  | Susp. Part.  |
| 6        | Boca Raton Fire Station #1<br>1151 N. Federal Highway<br>Boca Raton, Florida                           | 2915768N<br>05913137E | Susp. Part.  |
| 7.       | Royal Palm Beach Golf Course<br>Royal Palm Beach Blvd.<br>Royal Palm Beach, Florida                    | 2951437N<br>0578767E  | Discontinued<br>March 27, 1978   |
| 8.       | Belle Glade<br>Water Treatment Plant<br>1016 West Canal Street<br>Belle Glade, Florida                 | 2953082N<br>0533160E  | Discontinued<br>October 29, 1978   |
| 9        | Grammercy Park<br>Water Treatment Plant<br>Park Avenue<br>Grammercy Park, Florida                      | 2960537N<br>0587329E  | Discontinued<br>February 1, 1977   |
| 10       | Southwest Fire Department<br>1180 S. Military Trail<br>West Palm Beach, Florida                        | 2949018N<br>0588207E  | Susp. Part.  |

TABLE 5  
MONITORING SITE LOCATIONS (con't)

| SITE NO. | ADDRESS  | UTM ZONE 17          | MONITORING CAPABILITY             |
|----------|--|----------------------|-----------------------------------|
| 11       | St. Vincent DePaul Seminary<br>S. Military Trail<br>Boynton Beach, Florida               | 2932890N<br>0586927E | Discontinued<br>July 17, 1976     |
| 12       | College of Boca Raton<br>S. Military Trail<br>Boca Raton, Florida                        | 2918354N<br>0587320E | Susp. Part.                       |
| 13       | NOx SIP Site N8<br>Florida Atlantic University<br>Boca Raton, Florida                    | 2917000N<br>0589500E | Discontinued<br>October 1, 1978   |
| 14       | NOx SIP Site N9<br>Palm Beach Mall<br>Palm Beach Lakes Blvd.<br>West Palm Beach, Florida | 2956000N<br>0590700E | Discontinued<br>October 1, 1978   |
| 15       | Division of Forestry<br>Lat. 26° 41'N, Long 80° 16'E<br>Loxahatchee, Florida             |                      | Temperature<br>Inversion          |
| 16       | Flood Control Pump Station<br>Twenty Mile Bend<br>State Road 80                          | 2951402N<br>0562879E | Susp. Part.                       |
| 17       | Lake Harbor Water Treatment<br>Plant<br>Lake Harbor, Florida                             | 2952230N<br>0518600E | Discontinued<br>December 27, 1977 |
| 18       | Pahokee Health Department<br>1759 E. Main Street<br>Pahokee, Florida                     | 2967222N<br>0533760E | Discontinued<br>November 1, 1978  |
| 19       | Belle Glade Fire Station<br>22 W. Ave. "A"<br>Belle Glade, Florida                       | 2951420N<br>0532900E | Susp. Part.                       |
| 20       | Pahokee Sewage Treatment Plant<br>1050 McClure Road<br>Pahokee, Florida                  | 2964200N<br>0532300E | Susp. Part.                       |

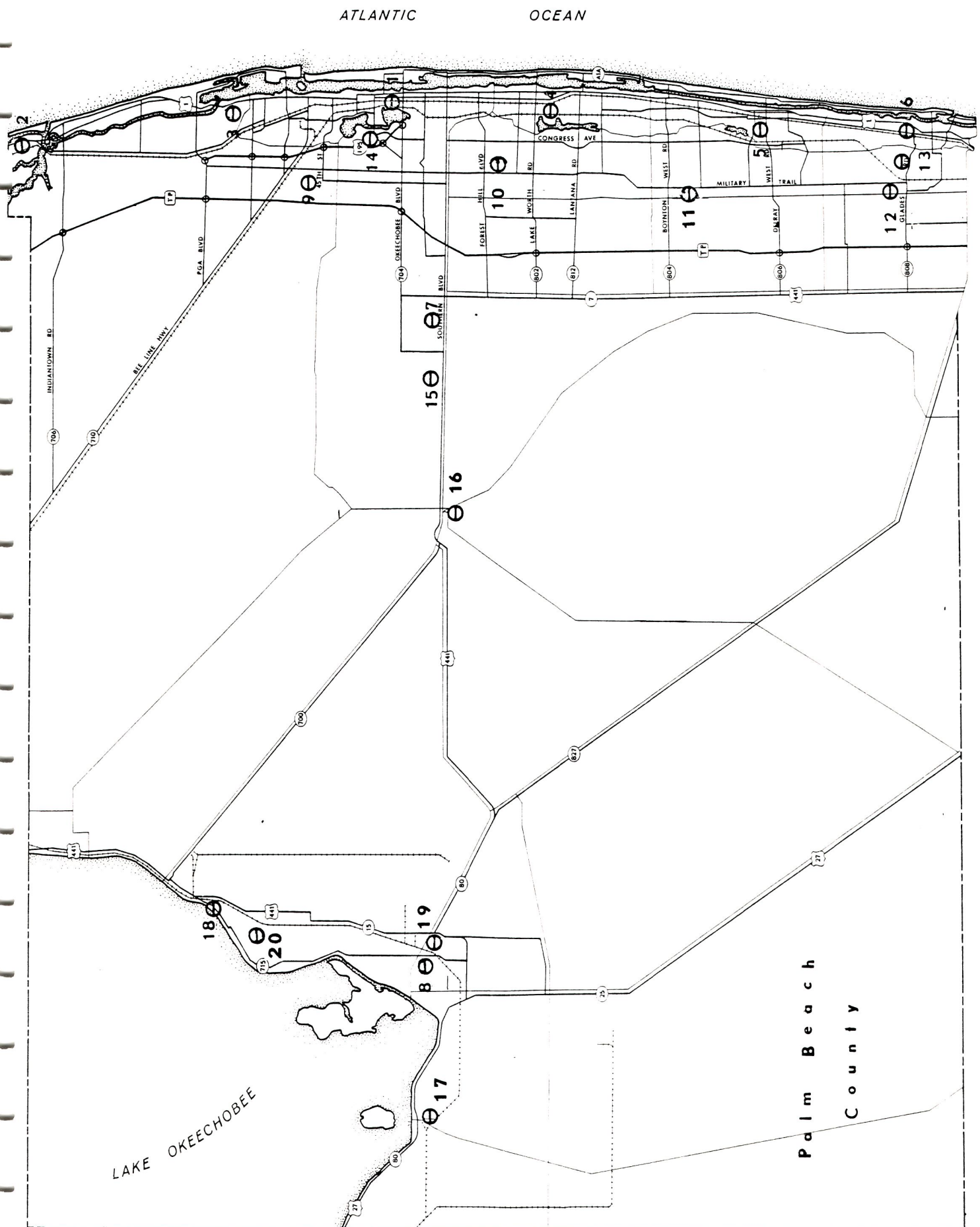




TABLE 6  
AMBIENT AIR QUALITY STANDARDS

| POLLUTANT (1)   | FEDERAL<br>PRIMARY | FEDERAL<br>SECONDARY          | STATE                         | MEASURED LEVELS<br>PALM BEACH COUNTY |          |                   |                     |
|---|--------------------|-------------------------------|-------------------------------|--------------------------------------|----------|-------------------|---------------------|
| Suspended Particulates                                |                    |                               |                               | See Table #7                         |          |                   |                     |
| Annual Geo. Mean                                      | 75                 | 60                            | 60                            | SITE                                 |          |                   |                     |
| Maximum 24 hr. Conc. (2)                              | 260                | 150                           | 150                           | <u>1</u>                             | <u>8</u> | <u>3</u>          | <u>13</u> <u>14</u> |
|   |                    |                               |                               | ppm                                  |          | ug/m <sup>3</sup> |                     |
| Sulfur Oxides   |                    |                               |                               |                                      |          |                   |                     |
| Annual Arith. Mean                                    | 80<br>(0.03 ppm)   |                               | 60<br>(0.02 ppm)              | 0.003                                | 0.010    |                   |                     |
| Maximum 24 hr. Conc.                                  | 365<br>(0.14 ppm)  |                               | 260<br>(0.1 ppm)              | 0.008                                | 0.019    |                   |                     |
| Maximum 3 hr. Conc. (2)                               |                    | 1,300<br>(0.5 ppm)            | 1,300<br>(0.5 ppm)            | 0.022                                | 0.043    |                   |                     |
| Carbon Monoxide                                       |                    |                               |                               |                                      |          |                   |                     |
| Maximum 8 hr. Conc. (2)                               | 10<br>(9 ppm)      | Same as<br>Federal<br>Primary | Same as<br>Federal<br>Primary | 4.5                                  |          |                   |                     |
| Maximum 1 hr. Conc.                                   | 40<br>(35 ppm)     |                               |                               | 8.6                                  |          |                   |                     |
| Photo Chem. Oxidants                                  |                    |                               |                               |                                      |          |                   |                     |
| Maximum 1 hr. Conc. (2)                               | 160<br>(0.08 ppm)  | Same as<br>Federal<br>Primary | Same as<br>Federal<br>Primary | 0.075                                |          |                   |                     |
| Nitrogen Oxides                                       |                    |                               |                               |                                      |          |                   |                     |
| Annual Arith. Mean                                    | 100<br>(0.05 ppm)  | Same as<br>Federal<br>Primary | Same as<br>Federal<br>Primary | 0.012                                |          | 26                | 19 29               |
| Hydrocarbons max. 3 hr. Conc.<br>(6-9 am) (2) (3) (4) | 160<br>(0.24 ppm)  | Same as<br>Federal<br>Primary | Same as<br>Federal<br>Primary | 4.0                                  |          |                   |                     |

- 1) All measurements are in ug/m<sup>3</sup> except CO which is mg/m<sup>3</sup>, or when indicated as ppm.
- 2) Concentration limits not to be exceeded more than once per year.
- 3) Used as a guide in devising plans to achieve oxidant standard.
- 4) Palm Beach County values not methane corrected.

TABLE 7  
SUSPENDED PARTICULATE MATTER, 1978

| SITE<br>NO. | Geometric Mean, ug/m <sup>3</sup> |            |            |            |        | GEO<br>STD<br>DEV | %ABOVE<br>OR BELOW<br>ANNUAL<br>STANDARD<br>(60 ug/m <sup>3</sup> ) | 24 HR<br>MAX<br>in ug/m <sup>3</sup> | NO. OF<br>SAMPLES<br>ABOVE DAILY<br>STANDARD<br>(150 ug/m <sup>3</sup> ) | TOTAL<br>NO. OF<br>SAMPLES<br>COLLECTED |
|-------------|-----------------------------------|------------|------------|------------|--------|-------------------|---|--------------------------------------|--|---|
|             | 1ST<br>QTR                        | 2ND<br>QTR | 3RD<br>QTR | 4TH<br>QTR | ANNUAL |                   |   |                                      |  |   |
| 1           | 40.9                              | 42.7       | 33.5       | 36.4       | 38.2   | 1.47              | -36.33  | 92                                   | 0  | 60                                      |
| 3           | 31.9                              | 29.7       | 30.9       | 28.5       | 30.2   | 1.42              | -49.67  | 65                                   | 0  | 61                                      |
| 4           | 50.4                              | 36.4       | 39.5       | 43.7       | 42.1   | 1.41              | -29.83  | 85                                   | 0  | 58                                      |
| 5           | 42.6                              | 34.7       | 33.3       | 30.8       | 35.0   | 1.45              | -41.67  | 99                                   | 0  | 61                                      |
| 6           | 41.6                              | 33.6       | 39.8       | 48.1       | 39.3   | 1.45              | -34.5   | 107                                  | 0  | 46                                      |
| 7           | 26.2                              | DISC       | DISC       | DISC       |        |                   |   | 36                                   | 0  | 12                                      |
| 8           | 65.2                              | 55.4       | 43.2       | 47.8       | 53.1   | 1.57              | -11.5   | 143                                  | 0  | 48                                      |
| 10          | 51.7                              | 41.1       | 42.9       | 39.4       | 43.6   | 1.41              | -27.33  | 77                                   | 0  | 60                                      |
| 12          | 33.1                              | 25.5       | 26.9       | 23.9       | 27.2   | 1.43              | -54.67  | 69                                   | 0  | 58                                      |
| 16          | 30.6                              | 32.8       | 25.5       | 27.2       | 28.7   | 1.50              | -52.17  | 136                                  | 0  | 59                                      |
| 18/20       | 30.8                              | 32.6       | 23.9       | 27.2       | 28.8   | 1.44              | -52.00  | 76                                   | 0  | 54                                      |
| 19          | 60.2                              | 49.4       | 42.7       | 46.2       | 49.6   | 1.45              | -17.33  | 121                                  | 0  | 52                                      |

TABLE 8  
TOTAL SUSPENDED PARTICULATES - 1978

| SITE<br>NO. | J | F | NUMBER OF SAMPLES |   |      |   |   |   |   |   |   |   |       |     | CONCENTRATION $\mu\text{g}/\text{m}^3$ |     |         |         |      |
|-------------|---|---|-------------------|---|------|---|---|---|---|---|---|---|-------|-----|--|-----|---------|---------|------|
|             |   |   | M                 | A | M    | J | J | A | S | O | N | D | TOTAL | MAX | 2ND<br>MAX.                            | MIN | A. MEAN | G. MEAN | Sg.  |
| 1           | 5 | 5 | 5                 | 5 | 5    | 5 | 6 | 5 | 4 | 5 | 5 | 5 | 60    | 92  | 91                                     | 18  | 41.3    | 38.2    | 1.47 |
| 3           | 5 | 5 | 5                 | 5 | 5    | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 61    | 65  | 62                                     | 12  | 32.1    | 30.2    | 1.42 |
| 4           | 5 | 4 | 5                 | 4 | 5    | 5 | 6 | 5 | 5 | 4 | 5 | 5 | 58    | 85  | 82                                     | 17  | 44.6    | 42.1    | 1.41 |
| 5           | 5 | 5 | 5                 | 5 | 5    | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 61    | 99  | 90                                     | 17  | 37.6    | 35.0    | 1.45 |
| 6           | 5 | 5 | 5                 | 4 | 5    | 5 | 4 | 5 | 2 | 0 | 4 | 2 | 46    | 107 | 70                                     | 18  | 42.2    | 39.3    | 1.45 |
| 7           | 5 | 4 | 3                 | - | DISC |   | - |   |   |   |   |   | 12    | 36  | 34                                     | 17  |         |         |      |
| 8           | 5 | 5 | 5                 | 4 | 4    | 5 | 6 | 4 | 5 | 5 | 0 | 0 | 48    | 143 | 122                                    | 22  | 58.8    | 53.1    | 1.57 |
| 10          | 5 | 5 | 5                 | 5 | 5    | 5 | 6 | 5 | 4 | 5 | 5 | 5 | 60    | 77  | 76                                     | 21  | 46.0    | 43.6    | 1.41 |
| 12          | 5 | 5 | 4                 | 5 | 5    | 5 | 6 | 5 | 5 | 5 | 3 | 5 | 58    | 69  | 53                                     | 14  | 29.0    | 27.2    | 1.43 |
| 16          | 5 | 5 | 5                 | 5 | 5    | 3 | 6 | 5 | 5 | 5 | 5 | 5 | 59    | 136 | 60                                     | 14  | 31.5    | 28.7    | 1.50 |
| 18/20       | 4 | 5 | 5                 | 5 | 5    | 5 | 3 | 3 | 5 | 5 | 4 | 5 | 54    | 76  | 56                                     | 16  | 30.8    | 28.8    | 1.44 |
| 19          | 3 | 5 | 5                 | 5 | 5    | 5 | 5 | 1 | 4 | 5 | 5 | 4 | 52    | 121 | 87                                     | 20  | 52.9    | 49.6    | 1.45 |



TABLE 9  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1978

| SITE NO. | ITEMS MEASURED               | ARITHMETIC AVERAGE ug/m <sup>3</sup> |      |      |      |      |      |      |      |      |      |      |      |        |
|----------|------------------------------|--------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--------|
|          |                              | J                                    | F    | M    | A    | M    | J    | J    | A    | S    | O    | N    | D    | ANNUAL |
| 1        | Total Suspended Particulates | 37.8                                 | 42.8 | 50.0 | 54.0 | 39.4 | 42.0 | 44.2 | 34.0 | 26.5 | 38.6 | 30.6 | 52.0 | 41.3   |
|          | Organics, Benzene Solubles   | 2.7                                  | 3.7  | 1.8  | 1.2  | 1.7  | 1.9  | 1.8  | 0.4  | 1.0  | 1.4  | 0.7  | 1.5  | 1.65   |
|          | Sulfates                     | 7.0                                  | 8.8  | 7.6  | 7.2  | 4.0  | 5.4  | 4.2  | 4.4  | 3.6  | 5.2  | 4.4  | 5.6  | 5.62   |
|          | Nitrates                     | 2.08                                 | 2.71 | 1.99 | 2.55 | 2.13 | 1.52 | 1.41 | 1.45 | .92  | 1.29 | 0.82 | 1.23 | 1.68   |
| 3        | Total Suspended Particulates | 29.0                                 | 33.6 | 36.2 | 38.0 | 23.2 | 35.0 | 40.2 | 32.8 | 26.2 | 25.8 | 31.8 | 32.0 | 32.1   |
|          | Organics, Benzene Solubles   | 1.0                                  | 2.7  | 0.7  | 0.7  | 0.3  | 1.3  | 1.1  | 0.6  | 0.6  | 0.2  | 0.6  | 1.1  | 0.91   |
|          | Sulfates                     | 6.2                                  | 8.0  | 5.6  | 6.6  | 3.0  | 5.2  | 4.4  | 4.0  | 4.8  | 4.3  | 5.3  | 4.1  | 5.12   |
|          | Nitrates                     | 2.03                                 | 2.34 | 1.39 | 2.55 | 1.56 | 1.21 | 1.43 | 1.61 | 1.12 | 1.01 | 1.08 | 0.96 | 1.52   |
| 4        | Total Suspended Particulates | 45.2                                 | 64.5 | 50.4 | 46.8 | 37.4 | 36.0 | 52.8 | 35.6 | 35.2 | 43.5 | 46.6 | 43.6 | 44.6   |
|          | Organics, Benzene Solubles   | 2.4                                  | 4.9  | 1.1  | 1.3  | 1.0  | 1.4  | 1.5  | 0.6  | 1.7  | 0.8  | 1.7  | 1.3  | 1.64   |
|          | Sulfates                     | 6.6                                  | 7.0  | 6.0  | 6.8  | 3.4  | 5.4  | 5.2  | 4.2  | 5.6  | 6.4  | 8.5  | 7.0  | 6.01   |
|          | Nitrates                     | 1.83                                 | 2.61 | 1.55 | 2.87 | 1.70 | 1.23 | 1.29 | 1.64 | 1.46 | 1.33 | 1.27 | 0.96 | 1.64   |

TABLE 9 (CONT)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1978

[illegible]

TABLE 9 (CONT)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1978

| SITE NO. | ITEMS MEASURED               | ARITHMETIC AVERAGE ug/m <sup>3</sup> |      |      |      |      |      |      |      |      |      |      |      |        |
|----------|------------------------------|--------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--------|
|          |                              | J                                    | F    | M    | A    | M    | J    | J    | A    | S    | O    | N    | D    | ANNUAL |
| 8        | Total Suspended Particulates | 45.2                                 | 84.6 | 86.8 | 83.8 | 59.2 | 40.6 | 64.5 | 32.2 | 39.4 | 50.8 | DISC | DISC | 58.8   |
|          | Organics, Benzene Solubles   | 2.3                                  | 3.9  | 0.8  | 1.2  | 1.3  | 1.4  | 1.6  | 1.3  | 1.7  | 0.9  | DISC | DISC | 1.64   |
|          | Sulfates                     | 5.8                                  | 8.2  | 5.2  | 6.8  | 4.0  | 3.8  | 3.6  | 4.0  | 3.4  | 5.1  | DISC | DISC | 4.99   |
|          | Nitrates                     | 2.16                                 | 2.87 | 1.80 | 2.13 | 1.92 | 1.53 | 1.40 | 1.18 | 1.38 | 1.24 | DISC | DISC | 1.76   |
| 10       | Total Suspended Particulates | 43.2                                 | 65.6 | 52.8 | 51.6 | 34.0 | 42.8 | 50.0 | 43.2 | 41.2 | 36.0 | 46.0 | 44.4 | 46.0   |
|          | Organics, Benzene Solubles   | 4.0                                  | 5.5  | 1.6  | 1.5  | 1.6  | 2.5  | 1.9  | 1.7  | 2.9  | 2.2  | 2.7  | 2.3  | 2.53   |
|          | Sulfates                     | 6.6                                  | 8.0  | 4.8  | 6.0  | 3.6  | 4.8  | 4.6  | 3.8  | 5.0  | 4.8  | 6.4  | 4.3  | 5.2    |
|          | Nitrates                     | 2.12                                 | 2.46 | 1.51 | 2.28 | 1.89 | 1.40 | 1.50 | 1.52 | 1.40 | 1.33 | 1.42 | .83  | 1.64   |
| 12       | Total Suspended Particulates | 29.2                                 | 37.8 | 35.0 | 31.6 | 24.2 | 24.4 | 33.7 | 30.8 | 23.6 | 21.0 | 32.3 | 25.6 | 29.0   |
|          | Organics, Benzene Solubles   | 1.6                                  | 2.1  | 0.3  | 0.8  | 0.7  | 1.2  | 0.6  | 0.7  | 1.5  | 0.4  | 1.3  | 0.5  | .98    |
|          | Sulfates                     | 6.4                                  | 8.4  | 6.2  | 5.8  | 3.6  | 3.6  | 2.6  | 3.2  | 5.2  | 4.4  | 6.4  | 4.6  | 5.03   |
|          | Nitrates                     | 1.94                                 | 2.26 | 1.43 | 1.79 | 1.43 | 1.12 | 1.02 | 1.26 | 1.09 | 1.08 | 1.33 | 1.18 | 1.41   |



TABLE 9 (CONT)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1978

| SITE NO. | ITEMS MEASURED               | ARITHMETIC AVERAGE ug/m <sup>3</sup> |      |      |      |      |      |      |      |      |      |      |      |        |
|----------|------------------------------|--------------------------------------|------|------|------|------|------|------|------|------|------|------|------|--------|
|          |                              | J                                    | F    | M    | A    | M    | J    | J    | A    | S    | O    | N    | D    | ANNUAL |
| 16       | Total Suspended Particulates | 30.2                                 | 35.8 | 31.0 | 56.4 | 26.4 | 29.3 | 33.2 | 25.8 | 22.6 | 22.4 | 33.0 | 31.2 | 31.5   |
|          | Organics, Benzene Solubles   | 2.1                                  | 1.7  | 0.4  | 0.7  | 0.8  | 1.5  | 0.7  | 0.7  | 1.5  | 1.5  | 0.4  | 0.6  | 1.05   |
|          | Sulfates                     | 5.8                                  | 7.6  | 4.6  | 6.6  | 2.8  | 5.8  | 3.4  | 2.8  | 4.2  | 4.4  | 6.4  | 4.3  | 4.89   |
|          | Nitrates                     | 1.92                                 | 2.53 | 1.47 | 2.66 | 1.45 | 1.55 | 1.18 | 1.33 | 1.23 | 1.00 | 1.69 | 1.16 | 1.60   |
| 18/20    | Total Suspended Particulates | 28.5                                 | 29.8 | 40.2 | 38.6 | 35.2 | 29.8 | 24.7 | 28.7 | 22.6 | 20.6 | 36.2 | 31.6 | 30.8   |
|          | Organics, Benzene Solubles   | 1.6                                  | 2.5  | 0.7  | 0.6  | 0.6  | 1.2  | 1.3  | 1.5  | 0.5  | 0.3  | 0.9  | 0.8  | 1.04   |
|          | Sulfates                     | 5.0                                  | 7.6  | 5.4  | 5.4  | 3.2  | 3.4  | 2.8  | 2.8  | 3.2  | 4.4  | 6.3  | 4.0  | 4.46   |
|          | Nitrates                     | 3.92                                 | 2.25 | 1.53 | 2.38 | 1.51 | 1.40 | 1.19 | 1.25 | 1.04 | 1.07 | 1.70 | 1.02 | 1.69   |
| 19       | Total Suspended Particulates | 50.0                                 | 64.8 | 71.2 | 68.0 | 49.6 | 39.4 | 50.4 | 34.0 | 39.0 | 38.8 | 60.0 | 49.8 | 52.9   |
|          | Organics, Benzene Solubles   | 3.8                                  | 4.1  | 0.9  | 1.2  | 1.5  | 1.4  | 2.0  | —    | 1.8  | 1.3  | 2.7  | 1.5  | 2.02   |
|          | Sulfates                     | 4.0                                  | 7.8  | 5.2  | 6.0  | 3.2  | 3.2  | 3.8  | —    | 5.2  | 4.7  | 8.4  | 6.4  | 5.26   |
|          | Nitrates                     | 1.92                                 | 2.62 | 1.64 | 2.63 | 1.5  | 1.21 | 1.46 | —    | 1.39 | 1.15 | 1.91 | 1.32 | 1.70   |



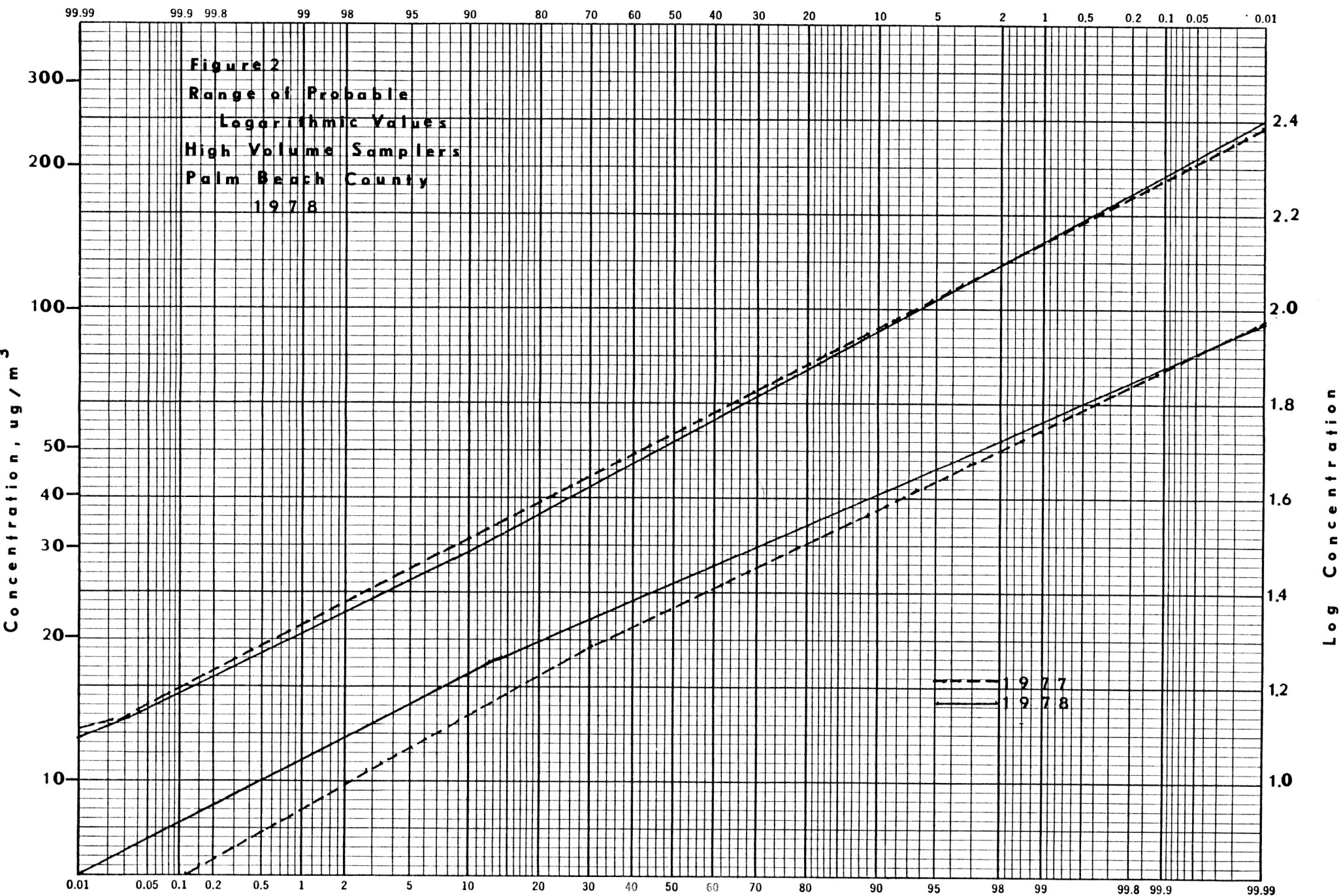




TABLE 10  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>  
1969-1978

| SITE<br>NO. | PARAMETER                | YEAR  |       |       |       |       |       |       |       |      |      |
|-------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
|             |                          | 1969  | 1970  | 1971  | 1972  | 1973  | 1974  | 1975  | 1976  | 1977 | 1978 |
| 1           | Maximum                  | 109.3 | 115.7 | 121.1 | 133.6 | 101.9 | 96.4  | 81.5  | 106.2 | 172  | 92   |
|             | Minimum                  | 9.6   | 13.9  | 15.2  | 15.2  | 10.8  | 19.6  | 20.0  | 15.8  | 17   | 18   |
|             | Arithmetic Mean          | 48.7  | 40.9  | 58.7  | 49.9  | 40.5  | 40.9  | 44.7  | 37.4  | 42.0 | 41.3 |
|             | Geometric Mean           | 43.9  | 39.5  | 53.4  | 45.9  | 38.0  | 38.8  | 42.4  | 35.3  | 38.3 | 38.2 |
|             | Geometric Std. Deviation | 1.56  | 1.42  | 1.19  | 1.49  | 1.49  | 1.38  | 1.39  | 1.41  | 1.50 | 1.47 |
| 2           | Maximum                  | 71.2  | 74.3  | 122.3 | 112.3 | 85.4  | 104.0 | 77.7  | 63.1  | 74   |      |
|             | Minimum                  | 7.3   | 13.3  | 10.7  | 12.2  | 5.3   | 19.6  | 11.9  | 14.0  | 12   |      |
|             | Arithmetic Mean          | 26.9  | 30.4  | 34.6  | 33.0  | 33.6  | 32.4  | 36.4  | 35.5  | 33.6 |      |
|             | Geometric Mean           | 24.6  | 28.3  | 30.8  | 30.3  | 31.4  | 30.6  | 34.1  | 33.4  | 30.9 |      |
|             | Geometric Std. Deviation | 1.51  | 1.45  | 1.61  | 1.48  | 1.49  | 1.36  | 1.45  | 1.44  | 1.50 |      |
| 3           | Maximum                  | 71.8  | 82.3  | 167.5 | 94.8  | 133.2 | 132.7 | 91.8  | 67.8  | 62   | 65   |
|             | Minimum                  | 7.7   | 1.3   | 0.4   | 12.8  | 16.6  | 16.1  | 14.6  | 10.3  | 11   | 12   |
|             | Arithmetic Mean          | 32.2  | 31.7  | 40.6  | 37.0  | 38.2  | 35.8  | 38.3  | 31.4  | 30.4 | 32.1 |
|             | Geometric Mean           | 29.5  | 28.4  | 30.7  | 33.7  | 35.3  | 32.2  | 34.5  | 29.1  | 28.4 | 30.2 |
|             | Geometric Std. Deviation | 1.63  | 1.76  | 2.93  | 1.49  | 1.47  | 1.54  | 1.61  | 1.50  | 1.45 | 1.42 |
| 4           | Maximum                  | 351.9 | 224.8 | 95.6  | 89.8  | 85.6  | 196.8 | 435.3 | 81.0  | 84   | 85   |
|             | Minimum                  | 7.3   | 8.0   | 10.2  | 12.9  | 13.3  | 18.3  | 19.6  | 12.7  | 14   | 17   |
|             | Arithmetic Mean          | 32.9  | 30.9  | 37.2  | 34.8  | 37.7  | 45.2  | 57.1  | 38.2  | 41.0 | 44.6 |
|             | Geometric Mean           | 26.4  | 28.2  | 31.7  | 32.2  | 35.3  | 38.8  | 47.9  | 35.8  | 39.1 | 42.1 |
|             | Geometric Std. Deviation | 1.78  | 1.47  | 1.85  | 1.49  | 1.39  | 1.67  | 1.64  | 1.44  | 1.38 | 1.41 |
| 5           | Maximum                  | 164.9 | 76.7  | 142.4 | 108.0 | 92.9  | 81.9  | 83.5  | 61.1  | 81   | 99   |
|             | Minimum                  | 13.3  | 8.3   | 12.2  | 15.9  | 10.9  | 13.8  | 22.0  | 13.8  | 18   | 17   |
|             | Arithmetic Mean          | 40.1  | 36.2  | 36.4  | 38.5  | 40.0  | 34.8  | 42.0  | 35.8  | 39.1 | 37.6 |
|             | Geometric Mean           | 38.8  | 33.6  | 32.0  | 35.4  | 37.6  | 32.2  | 39.5  | 34.0  | 37.0 | 35.0 |
|             | Geometric Std. Deviation | 1.47  | 1.49  | 1.64  | 1.49  | 1.46  | 1.53  | 1.41  | 1.40  | 1.41 | 1.45 |



TABLE 10 (CONT)  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>  
1969-1978

| SITE<br>NO. | PARAMETER                | YEAR  |       |       |       |       |       |       |       |      |      |
|-------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
|             |                          | 1969  | 1970  | 1971  | 1972  | 1973  | 1974  | 1975  | 1976  | 1977 | 1978 |
| 6           | Maximum                  | 83.1  | 80.1  | 237.9 | 275.3 | 106.5 | 92.4  | 114.8 | 62.8  | 79   | 107  |
|             | Minimum                  | 9.5   | 9.6   | 13.3  | 17.0  | 13.6  | 20.9  | 22.4  | 16.4  | 15   | 18   |
|             | Arithmetic Mean          | 36.4  | 33.5  | 49.1  | 44.9  | 43.1  | 41.6  | 45.4  | 35.6  | 39.3 | 42.2 |
|             | Geometric Mean           | 32.9  | 31.0  | 41.1  | 39.9  | 40.2  | 38.4  | 42.7  | 33.8  | 37.0 | 39.3 |
|             | Geometric Std. Deviation | 1.60  | 1.48  | 2.09  | 1.56  | 1.46  | 1.26  | 1.43  | 1.38  | 1.43 | 1.45 |
| 7           | Maximum                  | 52.5  | 71.7  | 131.5 | 102.0 | 65.5  | 98.3  | 70.5  | 55.2  | 64   | 36   |
|             | Minimum                  | 7.2   | 2.1   | 1.6   | 7.0   | 9.1   | 5.4   | 11.4  | 6.2   | 9    | 17   |
|             | Arithmetic Mean          | 23.6  | 25.8  | 30.7  | 31.8  | 28.1  | 25.6  | 33.0  | 23.1  | 24.3 |      |
|             | Geometric Mean           | 21.5  | 23.3  | 24.4  | 28.3  | 26.2  | 22.3  | 30.4  | 21.0  | 22.5 |      |
|             | Geometric Std. Deviation | 1.57  | 1.59  | 2.13  | 1.37  | 1.45  | 1.66  | 1.52  | 1.55  | 1.49 |      |
| 8           | Maximum                  | 175.7 | 273.9 | 222.7 | 173.3 | 151.0 | 210.9 | 199.4 | 125.2 | 149  | 143  |
|             | Minimum                  | 12.7  | 14.5  | 12.6  | 19.8  | 20.3  | 22.8  | 10.7  | 12.6  | 17   | 22   |
|             | Arithmetic Mean          | 53.8  | 54.6  | 61.4  | 58.6  | 59.8  | 59.8  | 62.4  | 61.6  | 59.0 | 58.8 |
|             | Geometric Mean           | 46.0  | 47.1  | 53.1  | 52.3  | 54.0  | 54.2  | 56.7  | 56.3  | 54.6 | 53.1 |
|             | Geometric Std. Deviation | 1.76  | 1.70  | 1.64  | 1.60  | 1.61  | 1.57  | 1.56  | 1.56  | 1.49 | 1.57 |
| 9           | Maximum                  |       |       |       | 74.50 | 145.3 | 81.2  | 65.3  | 59.1  | 33   |      |
|             | Minimum                  |       |       |       | 13.30 | 11.7  | 11.3  | 16.1  | 9.6   | 20   |      |
|             | Arithmetic Mean          |       |       |       | 31.2  | 33.2  | 29.9  | 34.1  | 28.2  |      |      |
|             | Geometric Mean           |       |       |       | 28.7  | 30.7  | 27.0  | 32.2  | 26.3  |      |      |
|             | Geometric Deviation      |       |       |       | 1.42  | 1.45  | 1.50  | 1.39  | 1.46  |      |      |
| 10          | Maximum                  |       |       |       | 94.80 | 109.0 | 113.0 | 81.7  | 101.6 | 98   | 77   |
|             | Minimum                  |       |       |       | 18.30 | 19.0  | 21.0  | 23.4  | 12.8  | 19   | 21   |
|             | Arithmetic Mean          |       |       |       | 44.4  | 45.3  | 43.0  | 47.2  | 42.8  | 41.4 | 46.0 |
|             | Geometric Mean           |       |       |       | 41.6  | 42.5  | 39.0  | 45.4  | 40.5  | 39.2 | 43.6 |
|             | Geometric Std. Deviation |       |       |       | 1.43  | 1.43  | 1.54  | 1.35  | 1.40  | 1.40 | 1.41 |

TABLE 10 (CONT)  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>  
1969-1978

| SITE  | NO. | PARAMETER                | YEAR |      |       |       |      |      |      |      |      |      |  |
|-------|-----|--------------------------|------|------|-------|-------|------|------|------|------|------|------|--|
|       |     |                          | 1969 | 1970 | 1971  | 1972  | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |  |
| 11    |     | Maximum                  | 69.9 | 77.8 | 134.3 | 299.9 | 60.8 |      |      |      |      |      |  |
|       |     | Minimum                  | 11.9 | 11.5 | 13.5  | 13.5  | 10.9 |      |      |      |      |      |  |
|       |     | Arithmetic Mean          | 32.1 | 30.8 | 34.4  | 44.9  |      |      |      |      |      |      |  |
|       |     | Geometric Mean           | 29.2 | 28.9 | 29.4  | 37.7  |      |      |      |      |      |      |  |
|       |     | Geometric Std. Deviation | 1.51 | 1.53 | 1.70  | 1.67  |      |      |      |      |      |      |  |
| 12    |     | Maximum                  | 68.1 | 79.6 | 200.7 | 64.9  | 53.7 | 66   | 69   |      |      |      |  |
|       |     | Minimum                  | 11.2 | 11.0 | 12.8  | 18.2  | 6.0  | 14   | 14   |      |      |      |  |
|       |     | Arithmetic Mean          | 29.6 | 31.6 | 34.9  | 34.2  | 26.9 | 29.8 | 29.0 |      |      |      |  |
|       |     | Geometric Mean           | 26.9 | 29.6 | 29.2  | 32.4  | 25.1 | 27.9 | 27.2 |      |      |      |  |
|       |     | Geometric Std. Deviation | 1.54 | 1.43 | 1.70  | 1.39  | 1.47 | 1.43 | 1.43 |      |      |      |  |
| 16    |     | Maximum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Minimum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Arithmetic Mean          |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Mean           |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Std. Deviation |      |      |       |       |      |      |      |      |      |      |  |
| 17    |     | Maximum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Minimum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Arithmetic Mean          |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Mean           |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Std. Deviation |      |      |       |       |      |      |      |      |      |      |  |
| 18/20 |     | Maximum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Minimum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Arithmetic Mean          |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Mean           |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Std. Deviation |      |      |       |       |      |      |      |      |      |      |  |
| 19    |     | Maximum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Minimum                  |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Arithmetic Mean          |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Mean           |      |      |       |       |      |      |      |      |      |      |  |
|       |     | Geometric Std. Deviation |      |      |       |       |      |      |      |      |      |      |  |

TABLE 11  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$   
1969-1978

| SITE NO. | PARAMETER                   | YEAR |      |      |      |      |      |      |      |      |      |  |
|----------|-----------------------------|------|------|------|------|------|------|------|------|------|------|--|
|          |                             | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |  |
| 7        | Total Suspended Particulate | 23.6 | 25.8 | 30.7 | 31.8 | 28.1 | 25.6 | 33.0 | 23.1 | 24.3 |      |  |
|          | Organics, Benzene Soluble   | 1.6  | 2.3  | 4.2  | 0.8  | 1.6  | 2.6  | 2.5  | 2.1  | 1.3  |      |  |
|          | Sulfates                    | 3.4  | 3.6  | 2.2  | 3.0  | 2.7  | 2.8  | 4.5  | 4.0  | 4.6  |      |  |
|          | Nitrates                    | 0.7  | 0.8  | 0.9  | 0.8  | 1.1  | 0.9  | 1.6  | 1.5  | 1.4  |      |  |
| 8        | Total Suspended Particulate | 53.8 | 54.6 | 61.4 | 58.6 | 59.8 | 59.8 | 62.4 | 61.6 | 59.0 | 58.8 |  |
|          | Organics, Benzene Soluble   | 2.8  | 3.6  | 5.6  | 2.0  | 2.5  | 3.2  | 3.0  | 2.5  | 2.2  | 1.6  |  |
|          | Sulfates                    | 4.2  | 4.1  | 3.3  | 3.4  | 4.0  | 4.0  | 4.8  | 5.7  | 5.6  | 5.0  |  |
|          | Nitrates                    | 0.8  | 1.0  | 1.2  | 1.1  | 1.4  | 1.0  | 1.8  | 1.9  | 1.6  | 1.8  |  |
| 9        | Total Suspended Particulate |      |      |      | 31.2 | 33.2 | 29.9 | 34.1 | 28.2 |      |      |  |
|          | Organics, Benzene Soluble   |      |      |      | 1.3  | 1.3  | 2.2  | 2.2  | 2.0  |      |      |  |
|          | Sulfates                    |      |      |      | 2.8  | 2.9  | 2.8  | 4.6  | 4.6  |      |      |  |
|          | Nitrates                    |      |      |      | 0.8  | 1.1  | 0.9  | 1.5  | 1.5  |      |      |  |
| 10       | Total Suspended Particulate |      |      |      | 44.4 | 45.3 | 43.0 | 47.2 | 42.8 | 41.4 | 46.0 |  |
|          | Organics, Benzene Soluble   |      |      |      | 1.2  | 2.8  | 3.2  | 3.6  | 3.4  | 2.6  | 2.5  |  |
|          | Sulfates                    |      |      |      | 2.5  | 3.1  | 2.7  | 4.2  | 4.8  | 4.9  | 5.2  |  |
|          | Nitrates                    |      |      |      | 0.8  | 1.0  | 0.8  | 1.3  | 1.5  | 1.4  | 1.6  |  |
| 11       | Total Suspended Particulate |      |      |      | 32.1 | 30.8 | 34.4 | 44.9 |      |      |      |  |
|          | Organics, Benzene Soluble   |      |      |      | 2.1  | 1.8  | 2.4  | 3.5  |      |      |      |  |
|          | Sulfates                    |      |      |      | 2.9  | 2.6  | 2.8  | 3.9  |      |      |      |  |
|          | Nitrates                    |      |      |      | 0.8  | 1.1  | 0.8  | 1.4  |      |      |      |  |
| 12       | Total Suspended Particulate |      |      |      | 29.6 | 31.6 | 34.9 | 34.2 | 26.9 | 29.8 | 29.0 |  |
|          | Organics, Benzene Soluble   |      |      |      | 1.4  | 1.3  | 2.7  | 2.5  | 1.8  | 1.8  | 1.0  |  |
|          | Sulfates                    |      |      |      | 2.7  | 3.6  | 3.1  | 4.8  | 4.8  | 5.5  | 5.0  |  |
|          | Nitrates                    |      |      |      | 0.8  | 1.0  | 0.7  | 1.7  | 1.5  | 1.4  | 1.4  |  |



TABLE 11  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$   
1969-1978

| SITE<br>NO. | PARAMETER                   | YEAR |      |      |      |      |      |      |      |      |      |
|-------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|
|             |                             | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
| 16          | Total Suspended Particulate |      |      |      |      |      |      |      | 35.0 | 30.9 | 31.5 |
|             | Organics, Benzene Soluble   |      |      |      |      |      |      |      | 2.7  | 1.6  | 1.0  |
|             | Sulfates                    |      |      |      |      |      |      |      | 4.3  | 5.3  | 4.9  |
|             | Nitrates                    |      |      |      |      |      |      |      | 1.8  | 1.6  | 1.6  |
| 17          | Total Suspended Particulate |      |      |      |      |      |      |      |      | 34.6 |      |
|             | Organics, Benzene Soluble   |      |      |      |      |      |      |      |      | 1.7  |      |
|             | Sulfates                    |      |      |      |      |      |      |      |      | 5.5  |      |
|             | Nitrates                    |      |      |      |      |      |      |      |      | 1.6  |      |
| 18/20       | Total Suspended Particulate |      |      |      |      |      |      |      |      |      | 30.8 |
|             | Organics, Benzene Soluble   |      |      |      |      |      |      |      |      |      | 1.0  |
|             | Sulfates                    |      |      |      |      |      |      |      |      |      | 4.5  |
|             | Nitrates                    |      |      |      |      |      |      |      |      |      | 1.7  |
| 19          | Total Suspended Particulate |      |      |      |      |      |      |      |      |      | 52.9 |
|             | Organics, Benzene Soluble   |      |      |      |      |      |      |      |      |      | 2.0  |
|             | Sulfates                    |      |      |      |      |      |      |      |      |      | 5.3  |
|             | Nitrates                    |      |      |      |      |      |      |      |      |      | 1.7  |

TABLE 12  
GASEOUS SAMPLING  
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.  
1970 - 1978

| SITE<br>NO. | SAMPLING DATES | SULFUR DIOXIDE |        |         | TOTAL OXIDANTS |        | O <sub>3</sub> |        |
|-------------|----------------|----------------|--------|---------|----------------|--------|----------------|--------|
|             |                | 1 HOUR         | 3 HOUR | 24 HOUR | 1 HOUR         | 8 HOUR | 1 HOUR         | 8 HOUR |
| 1           | 07/17-07/31/70 | 0.094          | 0.038  | 0.007   | 0.114          | 0.073  |                |        |
|             | 04/12-04/27/71 | 0.044          | 0.028  | >0.006  | >0.188         | >0.130 |                |        |
|             | 07/16-07/30/71 | 0.035          | 0.012  | 0.002   | 0.032          | 0.026  |                |        |
|             | 11/14-12/31/72 | 0.023          | 0.021  | 0.003   | >0.187         | >0.040 |                |        |
|             | 01/01-11/14/73 | 0.042          | 0.034  | 0.004   |                |        |                |        |
|             | 11/14-12/31/73 | 0.015          | 0.008  | 0.001   |                |        |                |        |
|             | 01/01-11/01/73 |                |        |         | 0.155          | 0.063  |                |        |
|             | 09/06-12/31/73 |                |        |         |                |        | >0.100         | >0.071 |
|             | 01/01-12/31/74 | 0.075          | 0.052  | 0.023   |                |        | 0.077          | 0.055  |
|             | 01/01-12/31/75 | 0.062          | 0.025  | 0.008   |                |        | 0.104          | 0.077  |
|             | 01/01-12/31/76 | 0.055          | 0.034  | 0.021   |                |        | 0.148          | 0.122  |
|             | 01/01-12/31/77 | 0.019          | 0.015  | 0.009   |                |        | 0.106          | 0.088  |
|             | 01/01-12/31/78 |                |        |         |                |        | 0.075          | 0.066  |
|             | 04/01-06/30/78 | 0.030          | 0.022  | 0.008   |                |        |                |        |
| 2           | 06/16-07/02/70 | 0.035          | 0.026  | 0.010   | 0.104          | 0.093  |                |        |
|             | 05/11-05/25/71 | 0.191          | 0.142  | 0.028   | 0.010          | 0.0004 |                |        |
|             | 08/13-08/27/71 | 0.033          | 0.015  | 0.003   | 0.016          | 0.018  |                |        |
| 3           | 07/02-07/17/70 | 0.196          | 0.128  | 0.028   | 0.176          | 0.086  |                |        |
|             | 04/27-05/11/71 | >0.500         | 0.324  | 0.060   | 0.111          | 0.055  |                |        |
|             | 07/30-08/13/71 | 0.064          | 0.035  | 0.005   | 0.007          | 0.001  |                |        |
|             | 05/18-06/30/72 | 0.053          | 0.032  | 0.006   | 0.116          | 0.071  |                |        |
|             | 09/03-12/31/76 |                |        | 0.004   |                |        |                |        |
|             | 01/01-12/31/77 |                |        | 0.004   |                |        |                |        |
| 4           | 07/31-08/14/70 | 0.031          | 0.024  | 0.010   | 0.129          | 0.089  |                |        |
|             | 03/26-04/12/71 | 0.044          | 0.034  | 0.012   | 0.110          | 0.106  |                |        |
|             | 09/23-10/04/71 | 0.080          | 0.035  | 0.006   | 0.056          | 0.048  |                |        |
|             | 11/10-11/19/71 | 0.000          | 0.000  | 0.000   | 0.078          | 0.073  |                |        |

TABLE 12  
GASEOUS SAMPLING  
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.  
1970 - 1978

| SITE<br>NO. | SAMPLING DATES    | SULFUR DIOXIDE |        |         | TOTAL OXIDANTS |        | O <sub>3</sub> |        |
|-------------|-------------------|----------------|--------|---------|----------------|--------|----------------|--------|
|             |                   | 1 HOUR         | 3 HOUR | 24 HOUR | 1 HOUR         | 8 HOUR | 1 HOUR         | 8 HOUR |
| 5           | 09/04-09/18/70    | 0.069          | 0.029  | 0.003   | 0.092          | 0.066  |                |        |
|             | 03/12-03/26/71    | 0.060          | 0.028  | 0.005   | 0.013          | 0.086  |                |        |
|             | 10/19-11/01/71    | 0.006          | 0.002  | 0.0003  | 0.136          | 0.101  |                |        |
| 6           | 08/21-09/04/70    | 0.076          | 0.048  | 0.013   | 0.048          | 0.037  |                |        |
|             | 01/27-02/12/71    | 0.132          | 0.098  | 0.017   | 0.110          | 0.095  |                |        |
|             | 12/29-01/12/72    | 0.068          | 0.034  | 0.006   | 0.000          | 0.000  |                |        |
|             | 07/05-08/01/72    | 0.015          | 0.012  | 0.003   | 0.050          | 0.027  |                |        |
| 7           | 09/28-10/12/70    | 0.106          | 0.048  | 0.006   | 0.076          | 0.068  |                |        |
|             | 02/26-03/12/71    | 0.026          | 0.008  | > 0.003 | 0.110          | 0.093  |                |        |
|             | 11/19-12/10/71    | 0.015          | 0.006  | 0.001   | 0.038          | 0.016  |                |        |
| 8           | 10/12-10/26/70    | 0.000          | 0.000  | 0.000   | 0.078          | 0.061  |                |        |
|             | 02/12-02/26/71    | > 0.288        | 0.125  | > 0.030 | 0.103          | 0.076  |                |        |
|             | 02/10-12/29/71    | > 0.267        | 0.217  | > 0.039 | 0.012          | 0.006  |                |        |
|             | 09/21/72-05/01/73 | 0.068          | 0.028  | 0.007   |                |        |                |        |
|             | 12/01/72-05/18/73 | 0.176          | 0.098  | 0.044   |                |        |                |        |
|             | 12/18-12/31/73    | 0.153          | 0.113  | 0.025   |                |        |                |        |
|             | 01/01-09/27/74    | 0.065          | 0.031  | 0.004   |                |        |                |        |
|             | 07/08-12/31/75    | 0.075          | 0.074  | 0.029   |                |        |                |        |
|             | 01/01-12/31/76    | 0.085          | 0.078  | 0.051   |                |        |                |        |
|             | 01/01-12/31/77    | 0.033          | 0.029  | 0.016   |                |        |                |        |
|             | 01/01-05/19/78    | 0.047          | 0.043  | 0.019   |                |        |                |        |
| 17          | 09/27-12/31/76    |                |        | 0.003   |                |        |                |        |
|             | 01/01-12/31/77    |                |        | 0.003   |                |        |                |        |



TABLE 12  
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.  
1970 - 1978

| SITE<br>NO. | SAMPLING DATES | NO <sub>2</sub> |        |          | CO     |        | HC     |        |
|-------------|----------------|-----------------|--------|----------|--------|--------|--------|--------|
|             |                | 1 HOUR          | 8 HOUR | AR./MEAN | 1 HOUR | 8 HOUR | 1 HOUR | 8 HOUR |
| 1           | 07/17-07/31/70 | 0.097           | 0.068  | 0.016    |        |        |        |        |
|             | 04/12-04/27/71 | 0.147           | 0.079  | 0.026    |        |        |        |        |
|             | 07/16-07/30/71 | 0.067           | 0.056  | 0.018    | 3.6    | 3.1    |        |        |
|             | 11/14-12/31/72 | 0.092           | 0.079  | 0.020    | 7.0    | 3.7    | 6.5    | 3.2    |
|             | 01/01-11/15/73 | 0.060           | 0.047  | 0.007    |        |        |        |        |
|             | 01/01-12/31/73 |                 |        |          | 8.9    | 6.3    | 5.5    | 3.3    |
|             | 01/01-12/31/74 | 0.080           | 0.052  | 0.015    | 10.5   | 8.8    | 5.8    | 4.4    |
|             | 01/01-12/31/75 | 0.125           | 0.083  | 0.015    | 8.6    | 5.0    | 5.2    | 3.0    |
|             | 01/01-12/31/76 | 0.083           | 0.054  | 0.009    | 10.5   | 5.2    | 5.3    | 3.7    |
|             | 01/01-12/31/77 | 0.071           | 0.044  | 0.017    | 11.8   | 8.5    | 5.2    | 3.6    |
|             | 01/01-12/31/78 | 0.089           | 0.070  | 0.012    | 8.6    | 4.5    |        |        |
|             | 10/18-12/31/78 |                 |        |          |        |        | 5.8    | 3.2    |
| 2           | 06/16-07/02/70 | 0.044           | 0.032  | 0.010    |        |        |        |        |
|             | 05/11-05/25/71 | 0.054           | 0.040  | 0.013    | 2.2    | 0.3    |        |        |
|             | 08/12-08/27/71 | 0.073           | 0.060  | 0.013    | 0.0    | 0.0    |        |        |
| 3           | 07/02-07/17/70 | 0.084           | 0.060  | 0.010    |        |        |        |        |
|             | 04/27-05/11/71 | 0.096           | 0.066  | 0.017    |        |        |        |        |
|             | 07/30-08/13/71 | 0.083           | 0.069  | 0.018    | 3.2    | 0.9    |        |        |
|             | 05/18-06/30/72 | 0.088           | 0.059  | 0.010    | 0.0    | 0.0    | 3.2    | 2.2    |
|             | 01/01-12/31/76 |                 |        | 0.006    |        |        |        |        |
|             | 01/01-12/31/77 |                 |        | 0.010    |        |        |        |        |
|             | 01/01-03/31/78 |                 |        | 0.014    |        |        |        |        |
| 4           | 07/31-08/14/70 | 0.097           | 0.068  | 0.016    |        |        |        |        |
|             | 03/26-04/12/71 | 0.118           | 0.107  | 0.018    | 2.1    | 0.3    |        |        |
|             | 09/23-10/14/71 | 0.059           | 0.041  | 0.018    | 0.0    | 0.0    |        |        |
|             | 11/10-11/19/71 | 0.124           | 0.101  | 0.020    | 0.0    | 0.0    |        |        |

TABLE 12  
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.  
1970 - 1978

| SITE<br>NO. | SAMPLING DATES | NO <sub>2</sub> |         |          | CO     |        | HC     |        |
|-------------|----------------|-----------------|---------|----------|--------|--------|--------|--------|
|             |                | 1 HOUR          | 8 HOUR  | AR./MEAN | 1 HOUR | 8 HOUR | 1 HOUR | 8 HOUR |
| 5           | 09/04-09/18/70 | 0.055           | 0.051   | 0.013    |        |        |        |        |
|             | 03/12-03/26/71 | 0.146           | 0.113   | 0.018    | 2.1    | 0.4    |        |        |
|             | 10/19-11/01/71 | 0.117           | 0.093   | 0.029    |        |        |        |        |
| 6           | 08/21-09/04/70 | 0.064           | 0.048   | 0.015    |        |        |        |        |
|             | 01/27-02/12/71 | > 0.200         | > 0.187 | 0.047    | 9.6    | 4.2    |        |        |
|             | 12/29-01/12/71 | 0.079           | 0.069   | 0.022    | 2.6    | 0.4    |        |        |
|             | 07/05-08/01/72 | 0.065           | 0.055   | 0.011    |        |        |        |        |
| 7           | 09/28-10/12/71 | 0.031           | 0.018   | 0.007    |        |        |        |        |
|             | 02/26-03/12/71 | 0.106           | 0.081   | 0.016    | 0.8    | 0.1    |        |        |
|             | 11/09-12/10/71 | 0.074           | 0.055   | 0.019    | 2.2    | 2.0    |        |        |
| 8           | 10/12-10/26/70 | 0.118           | 0.067   | 0.017    |        |        |        |        |
|             | 02/12-02/26/71 | 0.152           | 0.091   | 0.022    | 5.2    | 3.0    |        |        |
|             | 12/10-12/29/71 | 0.076           | 0.048   | 0.024    | 0.0    | 0.0    |        |        |
| 13          | 11/14-12/31/73 |                 |         | 0.003    |        |        |        |        |
|             | 01/01-12/31/74 |                 |         | 0.004    |        |        |        |        |
|             | 01/01-12/31/75 |                 |         | 0.008    |        |        |        |        |
|             | 01/01-12/31/76 |                 |         | 0.005    |        |        |        |        |
|             | 01/01-12/31/77 |                 |         | 0.008    |        |        |        |        |
|             | 01/01-12/31/78 |                 |         | 0.010    |        |        |        |        |
| 14          | 11/14-12/31/73 |                 |         | 0.004    |        |        |        |        |
|             | 01/01-12/31/74 |                 |         | 0.005    |        |        |        |        |
|             | 01/01-12/31/75 |                 |         | 0.012    |        |        |        |        |
|             | 01/01-12/31/76 |                 |         | 0.008    |        |        |        |        |
|             | 01/01-12/31/77 |                 |         | 0.015    |        |        |        |        |
|             | 01/01-12/31/78 |                 |         | 0.015    |        |        |        |        |

TABLE 13  
NITROGEN DIOXIDE DATA  
SITE NUMBER I  
1978

| <u>MONTH</u> | <u>HOURS</u> | ARITH. (a)<br>AVG., ppm | MAX. 24 HR.<br>AVG., PPM |
|--------------|--------------|-------------------------|--------------------------|
| J            | 273          | .016                    | .028                     |
| F            | 170          | .020                    | .031                     |
| M            | 403          | .013                    | .025                     |
| A            | 0            |                         |                          |
| M            | 207          | .012                    | .016                     |
| J            | 0            |                         |                          |
| J            | 277          | .007                    | .014                     |
| A            | 561          | .007                    | .015                     |
| S            | 347          | .012                    | .017                     |
| O            | 638          | .013                    | .030                     |
| N            | 405          | .014                    | .025                     |
| D            | 727          | .016                    | .038                     |
| ANNUAL       | 4008         | .012                    | .038                     |

(a) Standard is 0.05 ppm, annual arithmetic mean.



TABLE 14  
 AMBIENT AIR - NITROGEN DIOXIDE, PPM  
 SITE NUMBER 1  
 1978

|                       | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |       |        |
|-----------------------|-----------|-----------|-----------|-----------|--------|-------|--------|
| 1 Hr. Maximum         | .073      | .066      | .073      | .089      | .089   |       |        |
| 8 Hr. Maximum         | .062      | .026      | .030      | .070      | .070   |       |        |
| 24 Hr. Maximum        | .031      | .016      | .017      | .038      | .038   |       |        |
| Arith. Mean           | .016      | .012      | .009      | .014      | .012   |       |        |
|                       |           |           |           |           |        |       |        |
| Concentration Range   | HOURS     |           |           |           |        | %     | Cum. % |
| < 0.010               | 356       | 110       | 796       | 698       | 1960   | 48.90 | 48.90  |
| 0.010-0.019           | 293       | 77        | 284       | 657       | 1311   | 32.71 | 81.61  |
| 0.020-0.029           | 103       | 11        | 88        | 257       | 459    | 11.45 | 93.06  |
| 0.030-0.039           | 39        | 5         | 14        | 104       | 162    | 4.04  | 97.10  |
| 0.040-0.049           | 28        | 3         | 1         | 32        | 64     | 1.60  | 98.70  |
| 0.050-0.059           | 13        |           |           | 12        | 25     | .62   | 99.32  |
| 0.060-0.069           | 13        | 1         | 1         | 4         | 19     | .47   | 99.79  |
| 0.070-0.079           | 1         |           | 1         | 3         | 5      | .12   | 99.92  |
| 0.080-0.089           |           |           |           | 3         | 3      | .08   | 100.00 |
|                       |           |           |           |           |        |       |        |
| TOTAL                 | 846       | 207       | 1185      | 1770      | 4008   | 45.75 |        |
| TOTAL DOWNTIME        | 1314      | 1977      | 1023      | 438       | 4752   | 54.25 |        |
|                       |           |           |           |           |        |       |        |
| TOTAL TIME<br>at SITE | 2160      | 2184      | 2208      | 2208      | 8760   |       |        |

TABLE 15  
MANUAL SAMPLING, 1978  
NITROGEN DIOXIDE, ug/m<sup>3</sup>

| <u>SITE</u> | <u>NO. OF SAMPLES</u> | <u>ARITH. AVG. (a)</u> | <u>24 HR. MAX.</u> |
|-------------|-----------------------|------------------------|--------------------|
| 3           | 15                    | 26                     | 49                 |
| 13          | 43                    | 19                     | 52                 |
| 14          | 43                    | 29                     | 60                 |

(a) Standard is 100 ug/m<sup>3</sup> Annual Arithmetic Mean.

TABLE 16  
NO<sub>2</sub> BUBBLER  
SITE NUMBER 3  
1978

Concentrations = ug/m<sup>3</sup>

|                   | J  | F  | M  | A | M | J | J | A | S | O | N | D | ANNUAL |
|-------------------|----|----|----|---|---|---|---|---|---|---|---|---|--------|
| Number of Samples | 5  | 5  | 5  |   |   |   |   |   |   |   |   |   | 15     |
| Maximum           | 22 | 49 | 41 |   |   |   |   |   |   |   |   |   | 49     |
| Second Maximum    | 18 | 48 | 27 |   |   |   |   |   |   |   |   |   | 48     |
| A. Mean (a)       | 17 | 35 | 24 |   |   |   |   |   |   |   |   |   | 26     |
| Stand Dev.        | 3  | 16 | 11 |   |   |   |   |   |   |   |   |   | 13     |

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean



TABLE 17  
 NO<sub>2</sub> BUBBLER - N<sub>8</sub>  
 SITE NUMBER 13  
 1978

Concentrations = ug/m<sup>3</sup>

|                   | J  | F  | M  | A  | M  | J  | J  | A  | S  | O    | N | D | ANNUAL |
|-------------------|----|----|----|----|----|----|----|----|----|------|---|---|--------|
| Number of Samples | 5  | 4  | 5  | 4  | 5  | 5  | 5  | 5  | 5  | DISC | — | — | 43     |
| Maximum           | 25 | 52 | 33 | 24 | 27 | 31 | 22 | 24 | 33 | DISC | — | — | 52     |
| Second Maximum    | 21 | 44 | 24 | 13 | 12 | 17 | 19 | 21 | 25 | DISC | — | — | 44     |
| A. Mean (a)       | 18 | 37 | 23 | 13 | 13 | 18 | 17 | 16 | 19 | DISC | — | — | 19     |
| Stand Dev.        | 6  | 16 | 7  | 8  | 9  | 8  | 3  | 7  | 10 | DISC | — | — | 10     |

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean

TABLE 18  
 NO<sub>2</sub> BUBBLER - N<sub>9</sub>  
 SITE NUMBER 14  
 1978

Concentrations = ug/m<sup>3</sup>

|                   | J  | F  | M  | A  | M  | J  | J  | A  | S  | O    | N | D | ANNUAL |
|-------------------|----|----|----|----|----|----|----|----|----|------|---|---|--------|
| Number of Samples | 5  | 5  | 5  | 4  | 4  | 5  | 5  | 5  | 5  | DISC | — | — | 43     |
| Maximum           | 31 | 60 | 43 | 27 | 27 | 32 | 39 | 42 | 41 | DISC | — | — | 60     |
| Second Maximum    | 26 | 60 | 33 | 20 | 16 | 27 | 33 | 39 | 36 | DISC | — | — | 60     |
| A. Mean (a)       | 23 | 51 | 34 | 19 | 17 | 24 | 30 | 31 | 27 | DISC | — | — | 29     |
| Stand Dev.        | 6  | 17 | 6  | 6  | 7  | 6  | 9  | 11 | 12 | DISC | — | — | 13     |

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean

TABLE 19  
CARBON MONOXIDE DATA  
SITE NUMBER 1  
1978

| MONTH  | HOURS | ARITH.<br>MEAN<br>ppm | 1 HR.<br>MAX.<br>ppm | NO. OF HOURS<br>1 HR. STANDARD<br>(35 ppm)<br>EXCEEDED | 8 HR.<br>MAX.<br>ppm | NO. OF TIMES<br>8 HR. STANDARD<br>(9 ppm)<br>EXCEEDED |
|--------|-------|-----------------------|----------------------|--|----------------------|---|
| J      | 720   |                       | 5.2                  | 0  | 3.0                  | 0   |
| F      | 652   |                       | 4.0                  | 0  | 2.9                  | 0   |
| M      | 727   |                       | 4.9                  | 0  | 3.2                  | 0   |
| A      | 701   |                       | 5.0                  | 0  | 2.1                  | 0   |
| M      | 724   |                       | 3.3                  | 0  | 2.1                  | 0   |
| J      | 645   |                       | 5.4                  | 0  | 2.2                  | 0   |
| J      | 548   |                       | 4.2                  | 0  | 2.2                  | 0   |
| A      | 652   |                       | 4.0                  | 0  | 2.0                  | 0   |
| S      | 390   |                       | 3.2                  | 0  | 2.0                  | 0   |
| O      | 716   |                       | 3.8                  | 0  | 2.1                  | 0   |
| N      | 519   |                       | 5.7                  | 0  | 3.1                  | 0   |
| D      | 538   |                       | 8.6                  | 0  | 4.5                  | 0   |
| ANNUAL | 7532  | 1.1                   | 8.6                  | 0  | 4.5                  | 0   |



TABLE 20  
 AMBIENT AIR, CARBON MONOXIDE, PPM  
 SITE NUMBER 1  
 1978

|                       | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |       |        |
|-----------------------|-----------|-----------|-----------|-----------|--------|-------|--------|
| 1 Hr. Maximum         | 5.2       | 5.4       | 4.2       | 8.6       | 8.6    |       |        |
| 8 Hr. Maximum         | 3.2       | 2.2       | 2.2       | 4.5       | 4.5    |       |        |
| Concentration Range   |           |           | HOURS     |           |        | %     | Cum. % |
| < 2.0                 | 2036      | 2002      | 1534      | 1657      | 7229   | 95.98 | 95.98  |
| 2.0-2.4               | 26        | 39        | 34        | 64        | 163    | 2.16  | 98.14  |
| 2.5-2.9               | 14        | 12        | 14        | 23        | 63     | .84   | 98.98  |
| 3.0-3.4               | 11        | 10        | 6         | 6         | 33     | .44   | 99.42  |
| 3.5-3.9               | 6         | 1         |           | 10        | 17     | .23   | 99.65  |
| 4.0-4.4               | 2         | 2         | 2         | 2         | 8      | .11   | 99.76  |
| 4.5-4.9               | 3         | 1         |           | 2         | 6      | .08   | 99.84  |
| 5.0-5.4               | 1         | 3         |           | 2         | 6      | .08   | 99.92  |
| 5.5-5.9               |           |           |           | 1         | 1      | .01   | 99.93  |
| 6.0-6.4               |           |           |           | 2         | 2      | .02   | 99.95  |
| 6.5-6.9               |           |           |           | 1         | 1      | .01   | 99.96  |
| 8.0 >                 |           |           |           | 3         | 3      | .04   | 100.00 |
| Total                 | 2099      | 2070      | 1590      | 1773      | 7532   | 85.98 |        |
| Total<br>Downtime     | 61        | 114       | 618       | 435       | 1228   | 14.02 |        |
| Total<br>Time at Site | 2160      | 2184      | 2208      | 2208      | 8760   |       |        |

TABLE 21  
OZONE DATA  
SITE NUMBER 1  
1978

| MONTH  | HOURS | ARITH. MEAN<br>ppm | 1 HR. MAX.<br>ppm | NO. OF HOURS<br>1 HR. STANDARD<br>(0.08 ppm)<br>EXCEEDED |
|--------|-------|--------------------|-------------------|--|
| J      | 710   |                    | .057              | 0  |
| F      | 648   |                    | .075              | 0  |
| M      | 716   |                    | .065              | 0  |
| A      | 567   |                    | .069              | 0  |
| M      | 0     |                    |                   |  |
| J      | 321   |                    | .044              | 0  |
| J      | 0     |                    |                   |  |
| A      | 0     |                    |                   |  |
| S      | 0     |                    |                   |  |
| O      | 0     |                    |                   |  |
| N      | 0     |                    |                   |  |
| D      | 267   |                    | .045              | 0  |
| ANNUAL | 3229  | .024               | .075              | 0  |

TABLE 22  
 AMBIENT - AIR - OZONE, PPM  
 SITE NUMBER 1  
 1978

|                | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |
|----------------|-----------|-----------|-----------|-----------|--------|
| 1 Hr. Maximum  | .075      | .069      |           | .045      | .075   |
| 8 Hr. Maximum  | .066      | .062      |           | .037      | .066   |
| 24 Hr. Maximum | .047      | .052      |           | .030      | .052   |

| Concentration Range   | HOURS |      |      |      | %    | Cum. % |
|-----------------------|-------|------|------|------|------|--------|
| 0.010                 | 405   | 166  |      | 47   | 618  | 19.14  |
| 0.010-0.019           | 328   | 126  |      | 44   | 498  | 15.42  |
| 0.020-0.029           | 529   | 178  |      | 112  | 819  | 25.36  |
| 0.030-0.039           | 411   | 153  |      | 62   | 626  | 19.39  |
| 0.040-0.049           | 251   | 171  |      | 2    | 424  | 13.13  |
| 0.050-0.059           | 119   | 84   |      |      | 203  | 6.29   |
| 0.060-0.069           | 27    | 10   |      |      | 37   | 1.15   |
| 0.070-0.079           | 4     |      |      |      | 4    | .12    |
| Total                 | 2074  | 888  | 0    | 276  | 3229 | 36.86  |
| Total<br>Downtime     | 86    | 1296 | 2208 | 1941 | 5531 | 63.14  |
| Total Time<br>at Site | 2160  | 2184 | 2208 | 2208 | 8760 |        |



TABLE 23  
TOTAL HYDROCARBONS DATA  
SITE NUMBER 1  
1978

| MONTH  | HOURS | 3 HR. MAX.<br>(6 - 9 AM) (a) | ARITH. MEAN<br>ppm |
|--------|-------|------------------------------|--------------------|
| J      | 0     |                              |                    |
| F      | 0     |                              |                    |
| M      | 0     |                              |                    |
| A      | 0     |                              |                    |
| M      | 0     |                              |                    |
| J      | 0     |                              |                    |
| J      | 0     |                              |                    |
| A      | 0     |                              |                    |
| S      | 0     |                              |                    |
| O      | 282   | 2.4                          | 2.0                |
| N      | 367   | 2.5                          | 2.0                |
| D      | 289   | 4.0                          | 1.9                |
| Annual | 938   | 4.0                          | 2.0                |

(a) Standard is 0.24 ppm 3 hr. Maximum concentration, 6-9 A.M. not to be exceeded more than once a year. This standard is for hydrocarbons, methane corrected, and is not applicable to the values reported above.

TABLE 24  
 AMBIENT AIR - TOTAL HYDROCARBONS, PPM  
 SITE NUMBER 1  
 1978

|                     | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |       |        |
|---------------------|-----------|-----------|-----------|-----------|--------|-------|--------|
| 1 Hr. Maximum       |           |           |           | 5.8       | 5.8    |       |        |
| 8 Hr. Maximum       |           |           |           | 3.2       | 3.2    |       |        |
| 24 Hr. Maximum      |           |           |           | 2.3       | 2.3    |       |        |
| 3 Hr. Maximum       |           |           |           | 4.0       | 4.0    |       |        |
| 6 - 9 AM            |           |           |           |           |        |       |        |
| Concentration Range |           |           | HOURS     |           |        | %     | Cum. % |
| < 0.1               |           |           |           |           |        |       |        |
| 0.1 - 0.5           |           |           |           |           |        |       |        |
| 0.6 - 1.0           |           |           |           |           |        |       |        |
| 1.1 - 1.5           |           |           |           |           |        |       |        |
| 1.6 - 2.0           |           |           |           | 793       | 793    | 84.54 | 84.54  |
| 2.1 - 2.5           |           |           |           | 97        | 97     | 10.34 | 94.88  |
| 2.6 - 3.0           |           |           |           | 27        | 27     | 2.88  | 97.76  |
| 3.1 - 3.5           |           |           |           | 11        | 11     | 1.17  | 98.93  |
| 3.6 - 4.0           |           |           |           | 8         | 8      | .85   | 99.78  |
| 4.1 - 4.5           |           |           |           | 1         | 1      | .11   | 99.89  |
| 4.6 - 5.0           |           |           |           |           |        |       |        |
| 5.1 - 5.5           |           |           |           |           |        |       |        |
| 5.6 - 6.0           |           |           |           | 1         | 1      | .11   | 100.00 |
| Total               | 0         | 0         | 0         | 938       | 938    | 10.71 |        |
| Total Downtime      | 2160      | 2184      | 2208      | 1270      | 7822   | 89.29 |        |
| Total Time at Site  | 2160      | 2184      | 2208      | 2208      | 8760   |       |        |

TABLE 25  
SULFUR DIOXIDE DATA  
SITE NUMBER 1  
1978

| MONTH  | HOURS | ARITH.<br>MEAN<br>ppm | 1 HR.<br>MAX.<br>ppm | 3 HR.<br>MAX.<br>ppm | NO. OF TIMES<br>3 HR. STD.<br>EXCEEDED<br>(0.500 ppm) | 24 HR.<br>MAX.<br>ppm | NO. OF TIMES<br>24 HR. STD.<br>EXCEEDED<br>(0.1 ppm) |
|--------|-------|-----------------------|----------------------|----------------------|---|-----------------------|--|
| J      | 0     |                       |                      |                      |   |                       |  |
| F      | 0     |                       |                      |                      |   |                       |  |
| M      | 0     |                       |                      |                      |   |                       |  |
| A      | 372   | .004                  | .009                 | .009                 | 0   | .007                  | 0  |
| M      | 197   | .003                  | .030                 | .022                 | 0   | .008                  | 0  |
| J      | 94    | .002                  | .026                 | .016                 | 0   | .004                  | 0  |
| J      | 0     |                       |                      |                      |   |                       |  |
| A      | 0     |                       |                      |                      |   |                       |  |
| S      | 0     |                       |                      |                      |   |                       |  |
| O      | 0     |                       |                      |                      |   |                       |  |
| N      | 0     |                       |                      |                      |   |                       |  |
| D      | 0     |                       |                      |                      |   |                       |  |
| ANNUAL | 663   | .003                  | .030                 | .022                 | 0   | .008                  | 0  |



TABLE 26  
 AMBIENT AIR - SULFUR DIOXIDE, PPM  
 SITE NUMBER 1  
 1978

|                     | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |       |        |
|---------------------|-----------|-----------|-----------|-----------|--------|-------|--------|
| 1 Hr. Maximum       |           | .030      |           |           | .030   |       |        |
| 3 Hr. Maximum       |           | .022      |           |           | .022   |       |        |
| 24 Hr. Maximum      |           | .008      |           |           | .008   |       |        |
| Arithmetic Mean     |           | .003      |           |           | .003   |       |        |
| Concentration Range |           |           | HOURS     |           |        | %     | Cum. % |
| < 0.010             |           | 654       |           |           | 654    | 98.64 | 98.64  |
| 0.010-0.014         |           | 1         |           |           | 1      | .15   | 98.79  |
| 0.015-0.019         |           | 1         |           |           | 1      | .15   | 98.94  |
| 0.020-0.024         |           | 3         |           |           | 3      | .45   | 99.39  |
| 0.025-0.029         |           | 3         |           |           | 3      | .45   | 99.84  |
| 0.030-0.034         |           | 1         |           |           | 1      | .15   | 99.99  |
| 0.035-0.039         |           |           |           |           |        |       |        |
| 0.040-0.044         |           |           |           |           |        |       |        |
| 0.045-0.049         |           |           |           |           |        |       |        |
| 0.050-0.054         |           |           |           |           |        |       |        |
| 0.055-0.059         |           |           |           |           |        |       |        |
| 0.060-0.064         |           |           |           |           |        |       |        |
| Total               | 0         | 663       | 0         | 0         | 663    | 7.57  |        |
| Total Downtime      | 2160      | 1521      | 2208      | 2208      | 8097   | 92.43 |        |
| Total Time at Site  | 2160      | 2184      | 2208      | 2208      | 8760   |       |        |

TABLE 27  
SULFUR DIOXIDE DATA  
SITE NUMBER 8  
1978

| MONTH  | HOURS | ARITH.<br>MEAN<br>ppm | 1 HR.<br>MAX.<br>ppm | 3 HR.<br>MAX<br>ppm | NO. OF TIMES<br>3 HR. STD.<br>EXCEEDED<br>(0.500 ppm) | 24 HR.<br>MAX.<br>ppm | NO. OF TIMES<br>24 HR. STD.<br>EXCEEDED<br>(0.1 ppm) |
|--------|-------|-----------------------|----------------------|---------------------|---|-----------------------|--|
| J      | 371   | .004                  | .019                 | .018                | 0   | .008                  | 0  |
| F      | 541   | .012                  | .042                 | .039                | 0   | .019                  | 0  |
| M      | 394   | .010                  | .043                 | .040                | 0   | .015                  | 0  |
| A      | 152   | .012                  | .034                 | .033                | 0   | .018                  | 0  |
| M      | 167   | .010                  | .047                 | .043                | 0   | .017                  | 0  |
| J      | 0     |                       |                      |                     |   |                       |  |
| J      | 0     |                       |                      |                     |   |                       |  |
| A      | 0     |                       |                      |                     |   |                       |  |
| S      | 0     |                       |                      |                     |   |                       |  |
| O      | 0     |                       |                      |                     |   |                       |  |
| N      | 0     |                       |                      |                     |   |                       |  |
| D      | 0     |                       |                      |                     |   |                       |  |
| ANNUAL | 1625  | .010                  | .047                 | .043                | 0   | .019                  | 0  |

TABLE 28  
 AMBIENT AIR - SULFUR DIOXIDE, PPM  
 SITE NUMBER 8  
 1978

|                     | QUARTER 1 | QUARTER 2 | QUARTER 3 | QUARTER 4 | ANNUAL |       |        |
|---------------------|-----------|-----------|-----------|-----------|--------|-------|--------|
| 1 Hr. Maximum       | .043      | .047      |           |           | .047   |       |        |
| 3 Hr. Maximum       | .040      | .043      |           |           | .043   |       |        |
| 24 Hr. Maximum      | .019      | .018      |           |           | .019   |       |        |
| Arithmetic Mean     | .009      | .011      |           |           |        |       |        |
| Concentration Range |           |           | HOURS     |           |        | %     | Cum. % |
| < .010              | 760       | 158       |           |           | 918    | 56.49 | 56.49  |
| 0.010-0.014         | 275       | 50        |           |           | 325    | 20.00 | 76.49  |
| 0.015-0.019         | 143       | 47        |           |           | 190    | 11.69 | 88.18  |
| 0.020-0.024         | 66        | 35        |           |           | 101    | 6.22  | 94.40  |
| 0.025-0.029         | 29        | 13        |           |           | 42     | 2.58  | 96.98  |
| 0.030-0.034         | 21        | 11        |           |           | 32     | 1.97  | 98.95  |
| 0.035-0.039         | 10        | 3         |           |           | 13     | .80   | 99.75  |
| 0.040-0.044         | 2         |           |           |           | 2      | .12   | 99.87  |
| 0.045-0.049         |           | 2         |           |           | 2      | .12   | 99.99  |
| Total               | 1306      | 319       | 0         | 0         | 1625   | 18.55 |        |
| Total Downtime      | 854       | 1865      | 2208      | 2208      | 7135   | 81.45 |        |
| Total Time at Site  | 2160      | 2184      | 2208      | 2208      | 8760   |       |        |



V  
POLLUTANT STANDARD INDEX

The Environmental Protection Agency (EPA) has recommended a standardized daily air quality reporting index, called The Pollutant Standard Index (PSI), be used by State and local agencies. This index is dependent upon measured concentrations of the five pollutants which have been assigned National Ambient Air Quality Standards (NAAQS), Federal Episode Criteria, and Significant Harm Levels; i.e., total suspended particulate carbon monoxide, sulfur dioxide, nitrogen dioxide, and ozone. The index converts air pollution concentrations to a normalized number on a scale of zero to five hundred with the National Ambient Air Quality Standard for each pollutant being assigned the value of 100. This approach is believed to be easier for the public to understand than a report of actual pollutant concentrations. Index values are calculated for each of the five pollutants. The highest of these is the report value. Five descriptor words have been chosen to depict daily air quality: "good" (0-50), "moderate" (51-100), "unsatisfactory" (101-200), "unhealthful" (201-300), and "hazardous" (301-500). If pollutant concentrations warrant, the PSI report is expanded to include identification of the problem pollutant, cautionary statements and generalized health effects.

Adoption of the PSI by many pollution control organizations has reduced the confusion previously encountered due to the existances of many different indices. PSI has several advantages: 1) it is simple and can be easily understood by the public, 2) it can accommodate new pollutants, 3) it is based on a reasonable scientific premise, 4) it relates to National Ambient Air Quality Standards, Federal Episode Criteria, and Significant Harm Levels, and 5) it exhibits day to day variations.

The Palm Beach County Health Department samples for the above pollutants at the West Palm Beach Monitoring Site and has utilized the Pollution Standard Index since April 28, 1976. A typical air quality report for Palm Beach County would be "The Pollution Standard Index is 31.. The ambient air quality is within the good range." Index advisories are issued to local newspapers, televisions and radio stations each morning and afternoon Monday thru Friday. Figures 3 and 4 show daily plots of the P.S.I. for the year 1978. Table 29 gives a statistical analysis of the monthly morning and afternoon values. Of the twenty-one morning and the thirty-one afternoon P.S.I.'s which exceeded the "good" category, nine daily values were due to suspended particulate concentrations. All others reflected ozone concentrations.

TABLE 29  
POLLUTION STANDARD INDEX  
WEST PALM BEACH  
1978

| MONTH | DAYS |          | A.M. VALUES |         |      |     |
|-------|------|----------|-------------|---------|------|-----|
|       | GOOD | MODERATE | MAXIMUM     | MINIMUM | MEAN | SD. |
| Jan.  | 20   | 1        | 55          | 22      | 32   | 8   |
| Feb.  | 17   | 3        | 61          | 15      | 41   | 11  |
| March | 17   | 6        | 68          | 26      | 42   | 12  |
| April | 16   | 4        | 75          | 15      | 44   | 16  |
| May   | 22   | 0        | 46          | 12      | 27   | 8   |
| June  | 22   | 0        | 46          | 15      | 28   | 8   |
| July  | 18   | 1        | 58          | 18      | 31   | 11  |
| Aug.  | 23   | 0        | 41          | 11      | 22   | 8   |
| Sept. | 19   | 1        | 54          | 14      | 22   | 10  |
| Oct.  | 20   | 2        | 55          | 16      | 29   | 11  |
| Nov.  | 19   | 0        | 35          | 14      | 24   | 6   |
| Dec.  | 17   | 3        | 53          | 17      | 31   | 11  |
| Year  | 230  | 21       | 75          | 11      | 31   | 12  |

| MONTH | DAYS |          | P.M. VALUES |         |      |     |
|-------|------|----------|-------------|---------|------|-----|
|       | GOOD | MODERATE | MAXIMUM     | MINIMUM | MEAN | SD. |
| Jan.  | 18   | 3        | 81          | 12      | 39   | 15  |
| Feb.  | 12   | 8        | 76          | 25      | 51   | 15  |
| March | 15   | 8        | 69          | 23      | 48   | 14  |
| April | 15   | 5        | 65          | 16      | 41   | 17  |
| May   | 22   | 0        | 46          | 12      | 27   | 9   |
| June  | 22   | 0        | 42          | 15      | 28   | 7   |
| July  | 18   | 1        | 58          | 16      | 30   | 12  |
| Aug.  | 23   | 0        | 41          | 11      | 21   | 8   |
| Sept. | 19   | 1        | 54          | 13      | 22   | 9   |
| Oct.  | 20   | 2        | 55          | 16      | 29   | 11  |
| Nov.  | 19   | 0        | 35          | 14      | 25   | 6   |
| Dec.  | 17   | 3        | 53          | 17      | 32   | 11  |
| Year  | 220  | 31       | 81          | 11      | 32   | 14  |

Of the values in the Moderate category, T.S.P. values were responsible on nine days for both morning and afternoon PSIs. All others in the Moderate range were related to Ozone concentrations. No PSI values above the moderate zone were reported.



# A.M. POLLUTION STANDARD INDEX

WEST PALM BEACH, FLA.

1978

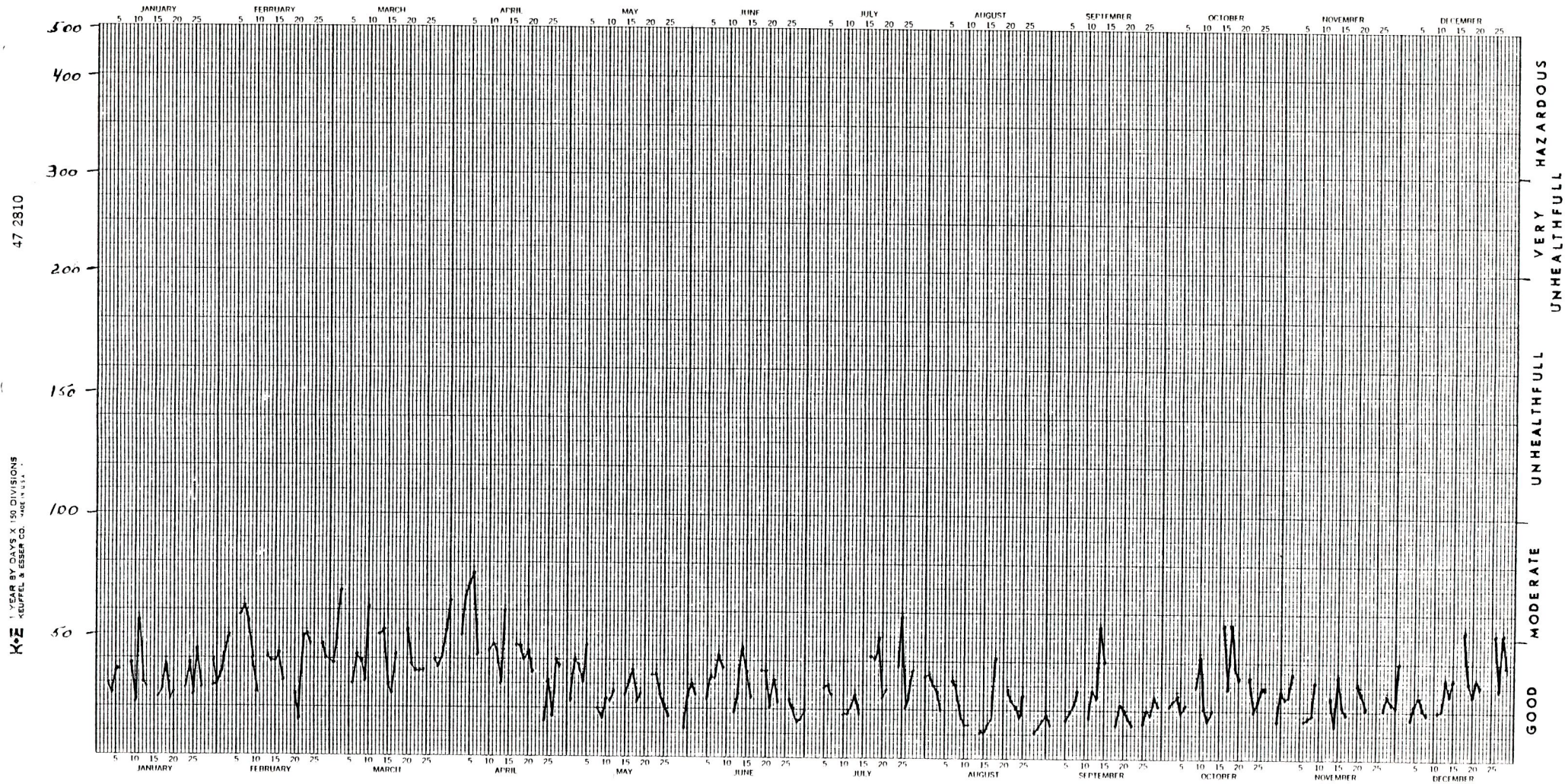


FIG. 3



P.M. POLLUTION STANDARD INDEX  
WEST PALM BEACH, FLA.

1978

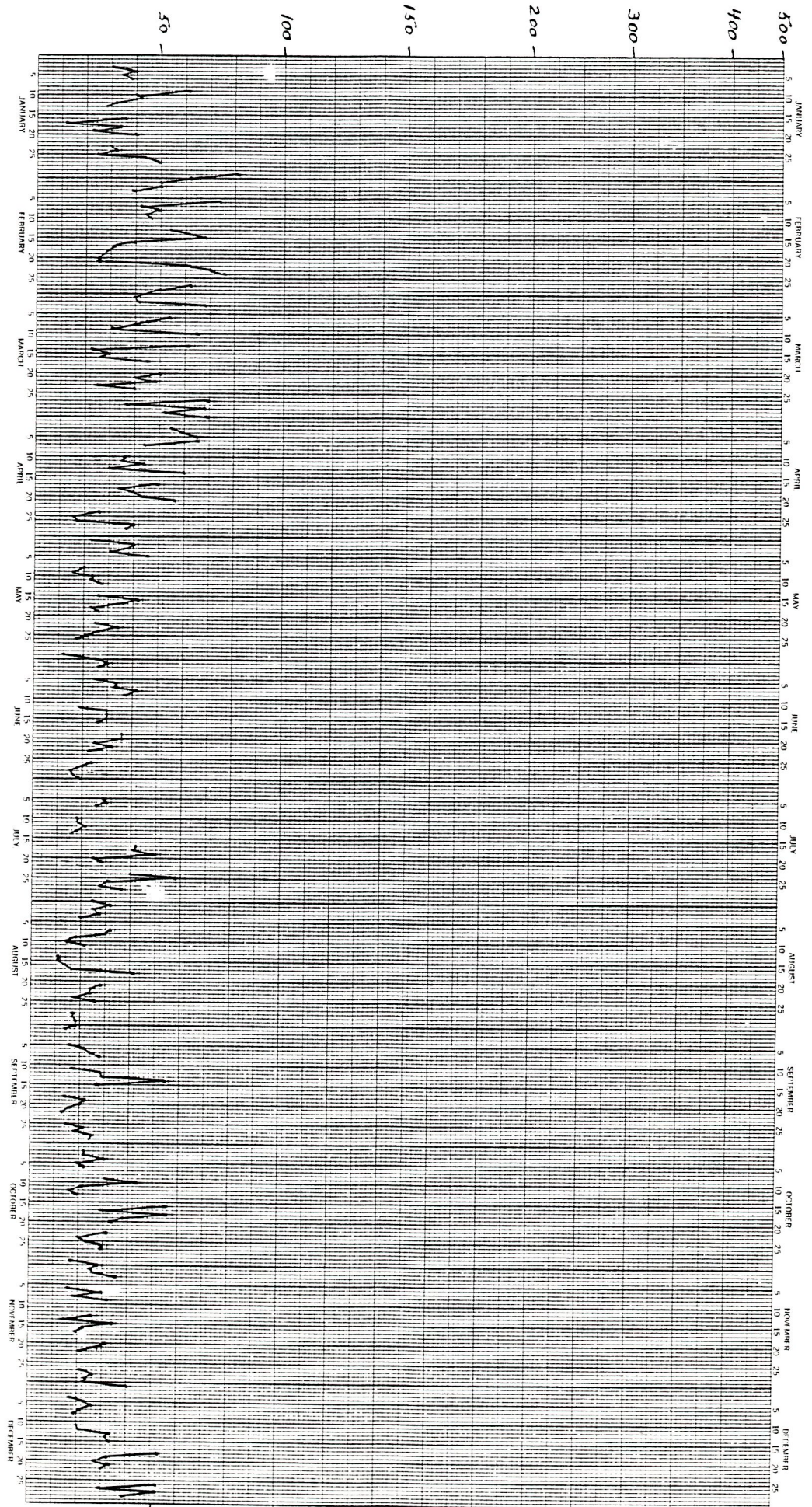


FIG. 4

GOOD MODERATE UNHEALTHFULL VERY UNHEALTHFULL HAZARDOUS



V1  
EMISSION INVENTORY

INTRODUCTION

Air Pollution has come about as a by-product of the technological advancement of modern society. In this advancement, society has developed ways to prevent and control atmospheric emissions.

An initial step towards improving the air pollution situation is to define the problem areas by determining the sources and components of air pollution. This is accomplished by the emission inventory, which addresses the source, pollutant types, and quantities of atmospheric emissions.

An emission inventory is an essential tool for an air pollution control program by providing: information for the design of an air sampling and air analysis program; the relative contribution of the various pollution sources; data for the development of control strategies; and information for regional planning authorities.

Limitations in the state-of-the-art knowledge introduce uncertainties in a number of factors, such as reported fuel usage figures, fuel composition, process information, and emission factors which will not produce highly precise information for the emission inventory. In spite of these limiting factors, the emission inventory can yield results with adequate accuracy for the purpose of a county air pollution survey.

The emission inventory presented in this report represents calculated emissions from major point sources and generalized estimates of emissions from area sources.

## MAJOR POINT SOURCES

During 1978, there were at least 20 major air pollution point sources in Palm Beach County which emitted a significant emission tonnage of one type of air pollutant or more. A list of these major sources found in this chapter details air emissions by type in tons per year during 1978.

## AREA SOURCES

Area sources represent a collection of many small sources which may emit only small quantities of air pollutants, but because of the great number of small sources, their collective impact may be very significant. The object of area source calculations is to obtain an accurate estimate of this collective contribution to total emissions. Such an estimate can never be exact because it would be impossible to determine the emissions from every small source individually.

Emission factors utilized in the inventory are found in:

(1) Compilation of Air Pollution Emission Factors, AP-42, Supplements 1-8, Second Edition, May 1978, published by the U.S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, 27711.

(2) Guidelines for Air Quality Maintenance Planning and Analysis, Volume 7: Projecting County Emissions, EPA-450/4-74-008, Second Edition, January 1975, U.S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, 27711.



(3) National Emissions Data System (NEDS) Source Classification Code and Emission Factor Listing, January 1979, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Monitoring and Data Analysis Division, National Air Data Branch, Research Triangle Park, North Carolina, 27711.

(4) Population figures were obtained from the Area Planning Board of Palm Beach County.

TABLE 30  
SUMMARY  
1978 AIR POLLUTION EMISSIONS  
PALM BEACH COUNTY, FLORIDA  
TONS/YEAR

| NEDS<br>NO.         | SOURCE NAME                   | POINT SOURCES |                 |                 |        |        |                 | TOTAL   |
|---------------------|-------------------------------|---------------|-----------------|-----------------|--------|--------|-----------------|---------|
|                     |                               | PARTICULATES  | SO <sub>2</sub> | SO <sub>3</sub> | CO     | HC     | NO <sub>2</sub> |         |
| 0005                | GULF & WESTERN FOOD CO.       | 542           | 842             | 3               | 577    | 574    | 387             | 2925    |
| 0011                | DIXIE ASPHALT                 | 27.4          | 106.8           | 1.4             | 1.7    | 0.3    | 20.4            | 158     |
| 0015                | BOCA RATON HOTEL              | 2.1           | 33.7            | 0.4             | 1.1    | 0.2    | 12.9            | 50.4    |
| 0016                | ATLANTIC SUGAR ASSOC.         | 273           | 444             | 3               | 192    | 189    | 156             | 1257    |
| 0018                | QUAKER OATS CO.               | 2             | 25              | 0.4             | 4      | 0.9    | 20              | 52.3    |
| 0019                | OSCEOLA FARMS CO.             | 195           | 464             | 3               | 202    | 199    | 162             | 1225    |
| 0021                | PRATT & WHITNEY               | 81            | 106             | 0.3             | 216    | 300    | 138             | 841.3   |
| 0026                | SUGAR CANE GROWERS COOP       | 398           | 1335            | 5               | 230    | 234    | 230             | 2432    |
| 0041                | IDEAL CEMENT                  | 1.4           |                 |                 |        |        |                 | 1.4     |
| 0042                | FLORIDA POWER & LIGHT         | 1247          | 5214            | 66              | 324    | 42     | 9996            | 16889   |
| 0045                | LAKE WORTH UTILITIES          | 43            | 289             | 4               | 89     | 27     | 953             | 1405    |
| 0050                | FLORIDA SUGAR REFINERY        | 13            | 179             | 2               | 3      | 0.5    | 31              | 228.5   |
| 0061                | U.S. SUGAR CORP. --<br>BRYANT | 123           | 263             | 1               | 191    | 190    | 126             | 894     |
| 0074                | TALISMAN SUGAR CORP.          | 120           | 311             | 1               | 202    | 201    | 307             | 1142    |
| 0081                | A.G. HOLLEY HOSPITAL          | 34            | 8               | 0.1             | 38     | 7      | 510             | 597.1   |
| 0083                | DOCTOR'S HOSPITAL             | 10            | 2               |                 | 12     | 3      | 77              | 104     |
| 0084                | EASTERN CEMENT                | 0.6           |                 |                 |        |        |                 | 0.6     |
| 0087                | RUBIN CONSTRUCTION CO.        | 10            | 46              | 0.7             | 2.3    | 0.5    | 10              | 69.5    |
| 0088                | CITY OF PAHOKEE               | 11            | 5               |                 | 15     | 5      | 5               | 41      |
| 0104                | SOUTHERN LINEN                | 4             | 0.2             |                 | 4      | 1      | 60              | 69.2    |
| POINT SOURCE TOTALS |                               | 3137.5        | 9673.7          | 91.3            | 2304.1 | 1974.4 | 13201.3         | 30382.3 |

Source

M. 2

9875

TABLE 31  
SUMMARY  
1978 AIR POLLUTION EMISSIONS  
PALM BEACH COUNTY, FLORIDA  
TON/YEAR

| AREA SOURCES                |              |                 |                 |          |         |                 |           |               |          |
|-----------------------------|--------------|-----------------|-----------------|----------|---------|-----------------|-----------|---------------|----------|
| AREA SOURCES                | PARTICULATES | SO <sub>2</sub> | SO <sub>3</sub> | CO       | HC      | NO <sub>2</sub> | ALDEHYDES | ORGANIC ACIDS | TOTALS   |
| MOBILE SOURCES:             |              |                 |                 |          |         |                 |           |               |          |
| Highway                     | 1469         | 677             |                 | 170888   | 21112   | 10221           | 19        | 19            | 204405   |
| Aircraft                    | 17           | 31              |                 | 2406     | 328     | 287             |           |               | 3069     |
| Vessels                     | 11           | 88              |                 | 3        | 2       | 18              |           |               | 122      |
| Railroads                   | 47           | 107             |                 | 244      | 177     | 695             | 10        | 13            | 1293     |
| STATIONARY FUEL COMBUSTION: |              |                 |                 |          |         |                 |           |               |          |
| Natural Gas                 | 17           | 1               |                 | 20       | 3       | 267             |           |               | 308      |
| Liquid Petroleum Gas        | 11           | 0.1             |                 | 10       | 2       | 73              |           |               | 96.1     |
| Fuel Oil                    | 37           | 1595            | 21              | 65       | 13      | 339             |           |               | 2070     |
| MINERAL PRODUCTS:           |              |                 |                 |          |         |                 |           |               |          |
| Concrete Batching           | 15           |                 |                 |          |         |                 |           |               | 15       |
| SOLID WASTE DISPOSAL:       |              |                 |                 |          |         |                 |           |               |          |
| Incineration                | 6            | 2               |                 | 6        | 2       | 10              |           |               | 26       |
| Open Burning                | 1351         |                 |                 | 11127    | 1907    |                 |           |               | 14385    |
| SUGAR CANE FIELD:           |              |                 |                 |          |         |                 |           |               |          |
| Burning                     | 5301         |                 |                 | 51121    | 10098   |                 |           |               | 66520    |
| EVAPORATION LOSS:           |              |                 |                 |          |         |                 |           |               |          |
| Solvent                     |              |                 |                 |          | 4806    |                 |           |               | 4806     |
| Petroleum Storage           |              |                 |                 |          | 567     |                 |           |               | 567      |
| Petroleum Marketing         |              |                 |                 |          | 2722    |                 |           |               | 2722     |
| AREA SOURCE TOTALS          | 8282         | 2501.1          | 21              | 235890   | 41739   | 11910           | 29        | 32            | 300404.1 |
| POINT SOURCE TOTALS         | 3137.5       | 9673.7          | 91.3            | 2304.1   | 1974.4  | 13201.3         |           |               | 30382.3  |
| GRAND TOTAL:                | 11419.5      | 12174.8         | 112.3           | 238194.1 | 43713.4 | 25111.3         | 29        | 32            | 330786.4 |



